APPENDIX B

EXPIRED STORMWATER DISCHARGE PERMITS

AERIAL MAPS AND CPv BMP MODELS

DuBois & King inc.

TAFTS FARM COMMERCIAL: PERMIT 1-0513

Source: USGS
Source: NASA, NGA, USGS
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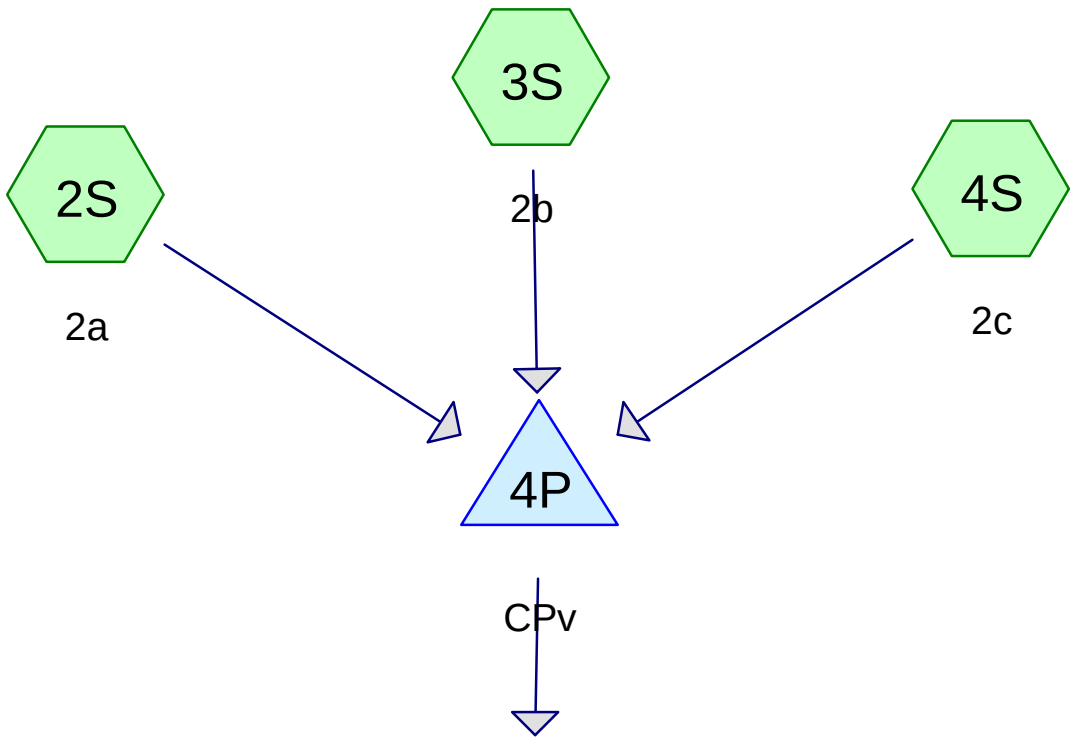

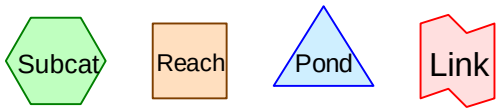

Drainage Diagram for 1-0513_LotG- D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
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Summary for Subcatchment 2S: 2a

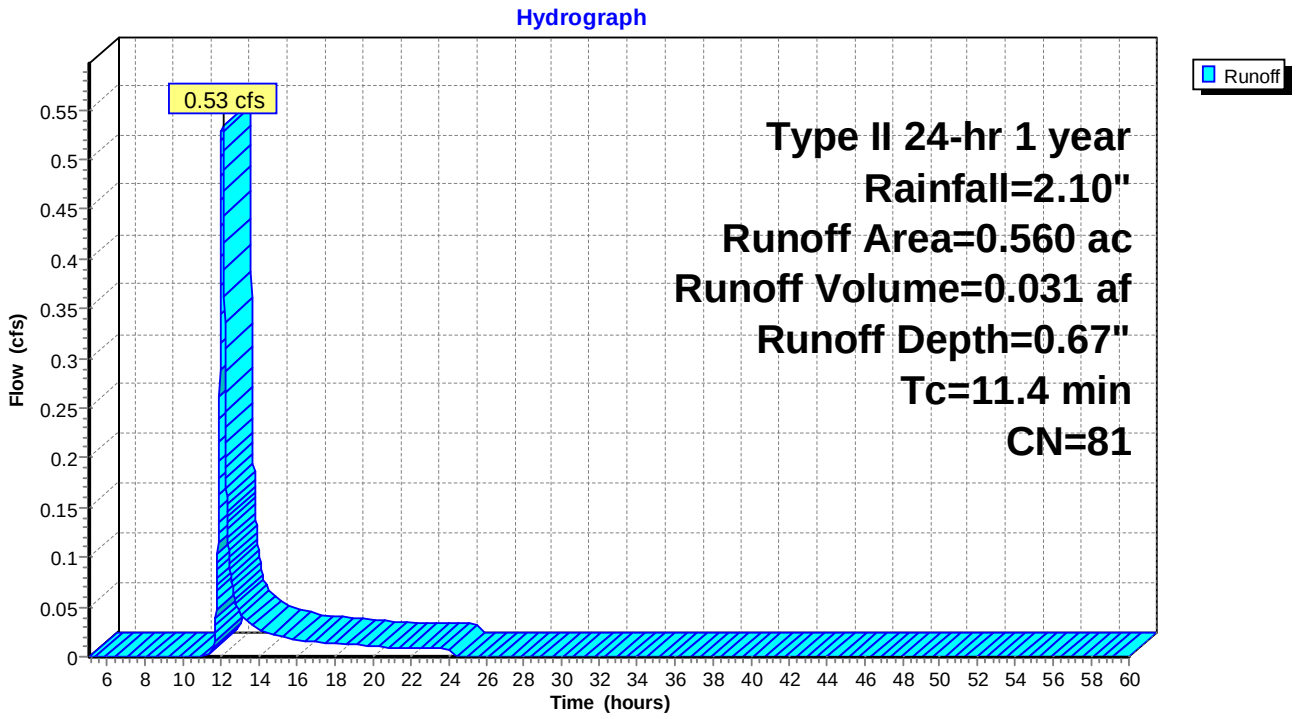
Runoff = 0.53 cfs @ 12.04 hrs, Volume= 0.031 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.560	81	
	0.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4					**Direct Entry,**

Subcatchment 2S: 2a



Summary for Subcatchment 3S: 2b

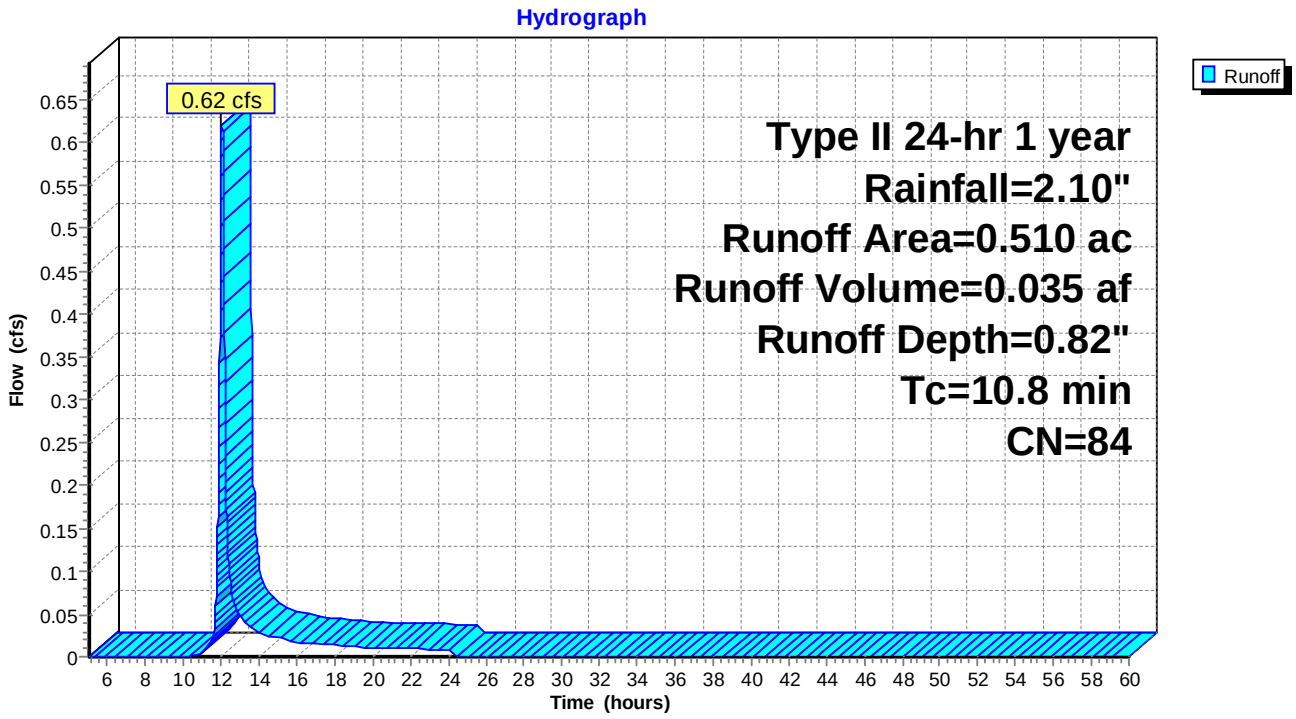
Runoff = 0.62 cfs @ 12.03 hrs, Volume= 0.035 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.510	84	
	0.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8					**Direct Entry,**

Subcatchment 3S: 2b



Summary for Subcatchment 4S: 2c

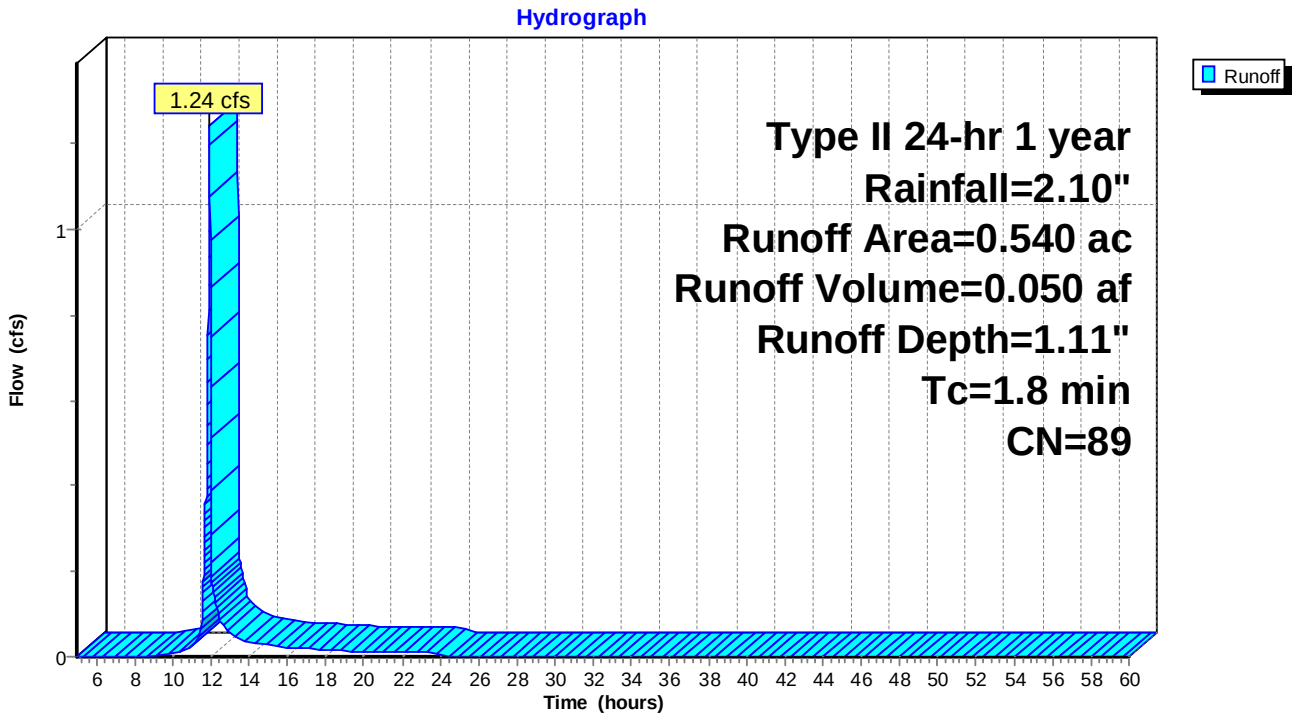
Runoff = 1.24 cfs @ 11.92 hrs, Volume= 0.050 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-60.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.540	89	
	0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8					**Direct Entry,**

Subcatchment 4S: 2c



Summary for Pond 4P: CPv

Inflow Area = 1.610 ac, 0.00% Impervious, Inflow Depth = 0.86" for 1 year event
Inflow = 1.89 cfs @ 11.93 hrs, Volume= 0.116 af
Outflow = 0.05 cfs @ 16.60 hrs, Volume= 0.114 af, Atten= 97%, Lag= 279.9 min
Primary = 0.05 cfs @ 16.60 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.01 hrs
Peak Elev= 480.92' @ 16.60 hrs Surf.Area= 0.080 ac Storage= 0.074 af

Plug-Flow detention time= 748.7 min calculated for 0.114 af (98% of inflow)
Center-of-Mass det. time= 738.7 min (1,581.2 - 842.5)

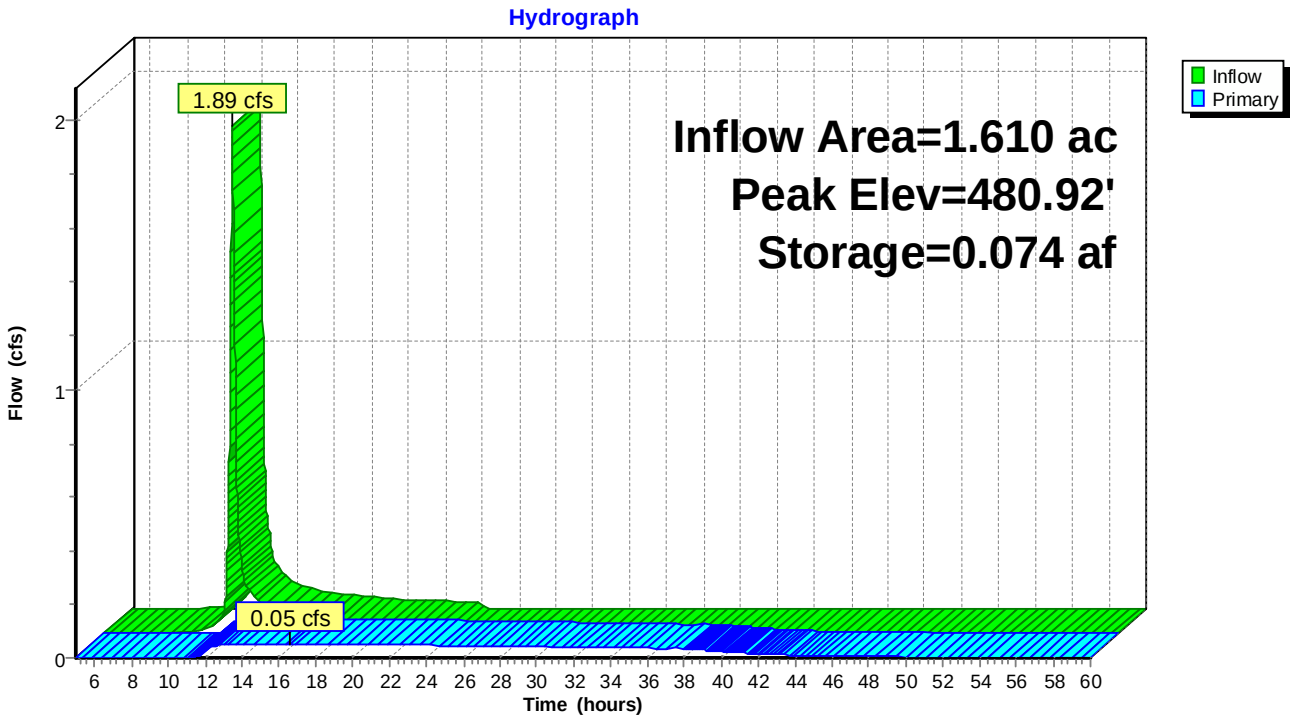
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.160 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

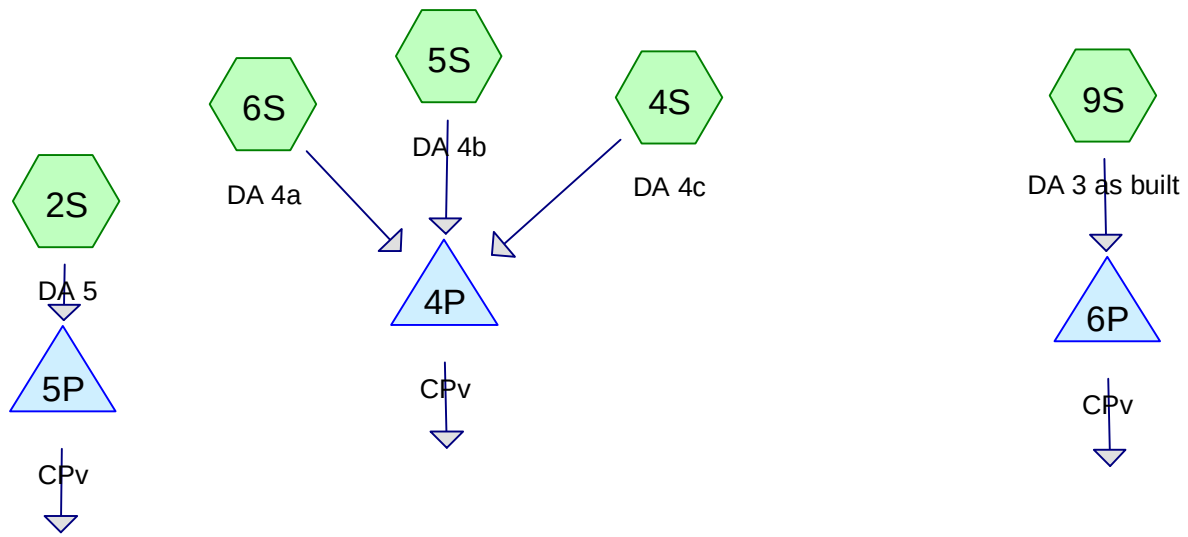
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.080	0.000	0.000
481.00	0.080	0.080	0.080
482.00	0.080	0.080	0.160

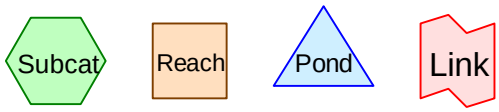
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.05 cfs @ 16.60 hrs HW=480.92' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.05 cfs @ 2.39 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
1.89 cfs
0.05 cfs
Inflow Area=1.610 ac
Peak Elev=480.92'
Storage=0.074 af
Flow (cfs)
0
1
2
6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)





Drainage Diagram for 1-0513_townhouses- D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
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Summary for Subcatchment 2S: DA 5

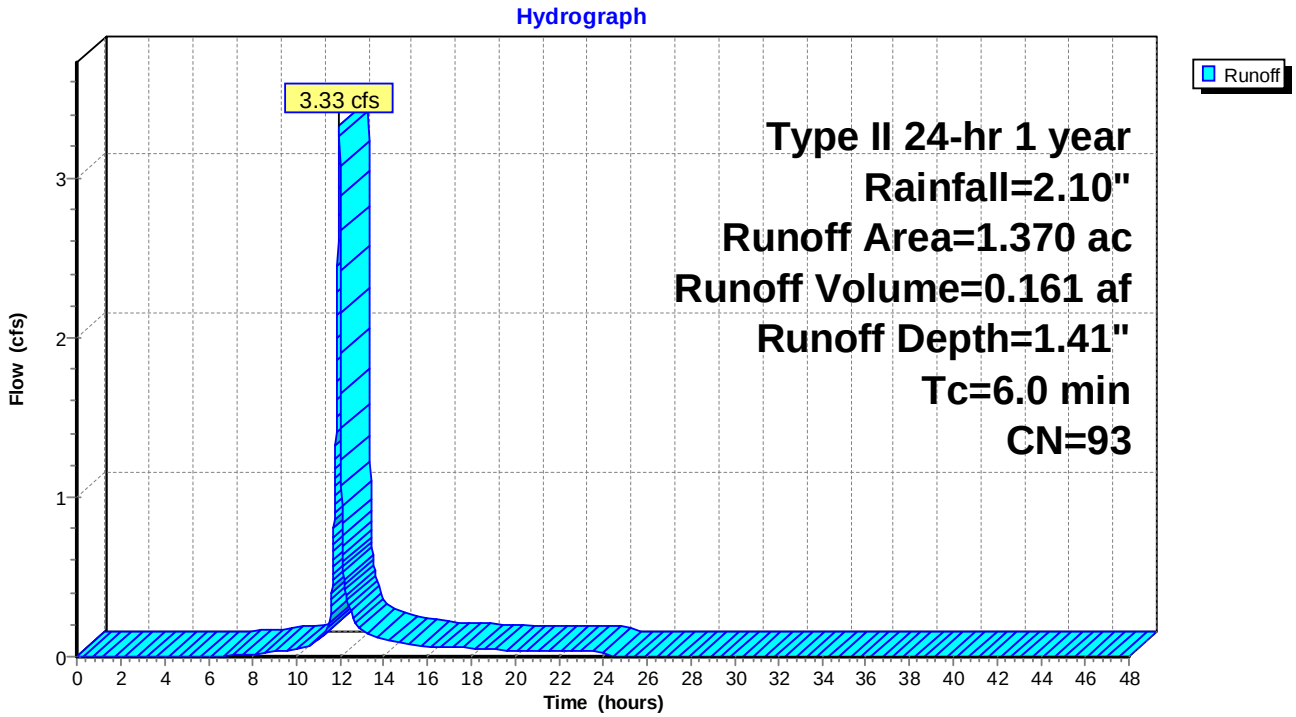
Runoff = 3.33 cfs @ 11.97 hrs, Volume= 0.161 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.980	98	Impervious
*	0.390	80	Lawn HSG D
	1.370	93	Weighted Average
	0.390		28.47% Pervious Area
	0.980		71.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, from file**

Subcatchment 2S: DA 5



Summary for Subcatchment 4S: DA 4c

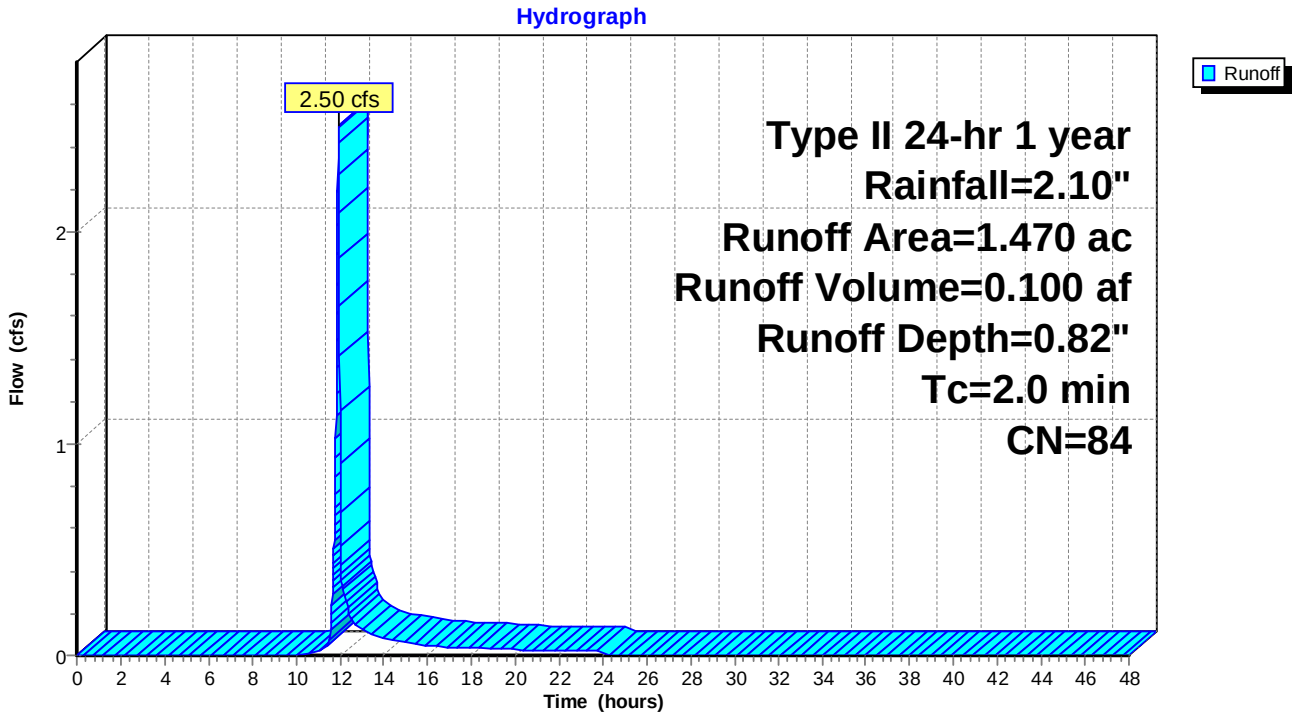
Runoff = 2.50 cfs @ 11.93 hrs, Volume= 0.100 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.320	98	Impervious
*	0.970	80	Lawn HSG D
*	0.180	77	Lawn HSG C/D
	1.470	84	Weighted Average
	1.150		78.23% Pervious Area
	0.320		21.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0					**Direct Entry,**

Subcatchment 4S: DA 4c



Summary for Subcatchment 5S: DA 4b

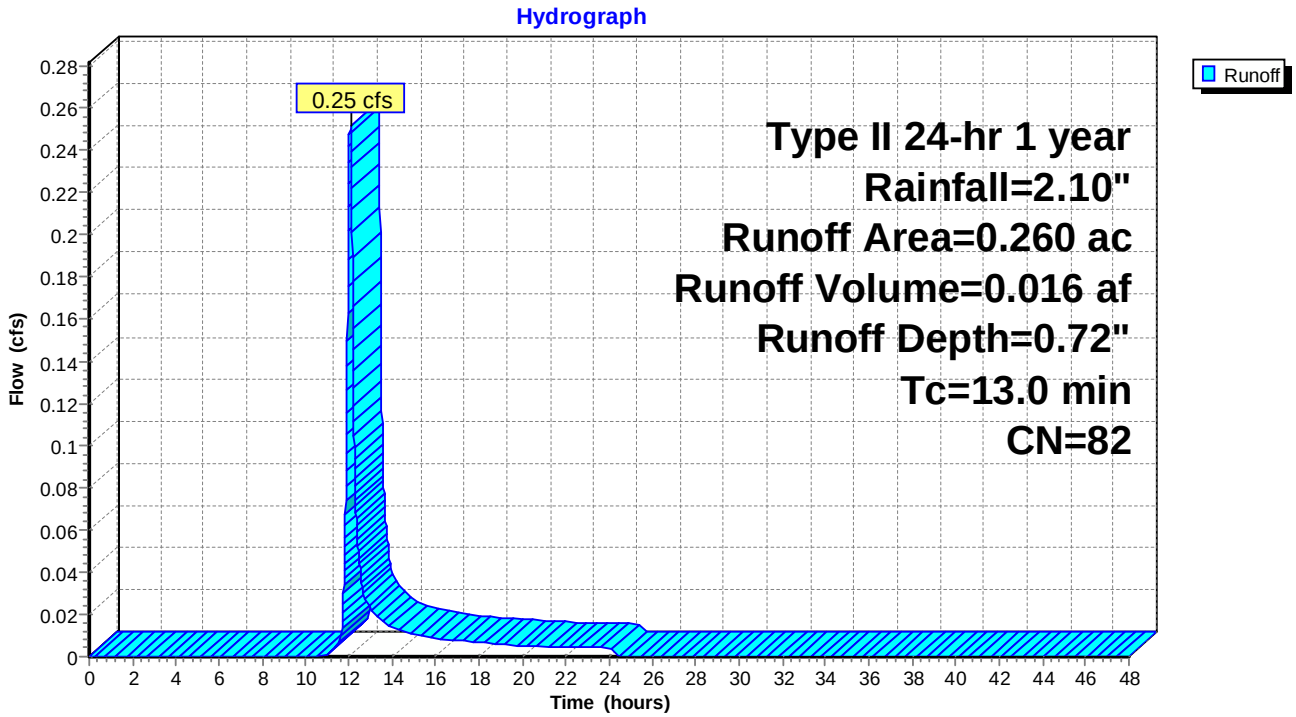
Runoff = 0.25 cfs @ 12.06 hrs, Volume= 0.016 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.030	98	Impervious
*	0.230	80	Grass, HSG D
	0.260	82	Weighted Average
	0.230		88.46% Pervious Area
	0.030		11.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0					**Direct Entry,**

Subcatchment 5S: DA 4b



Summary for Subcatchment 6S: DA 4a

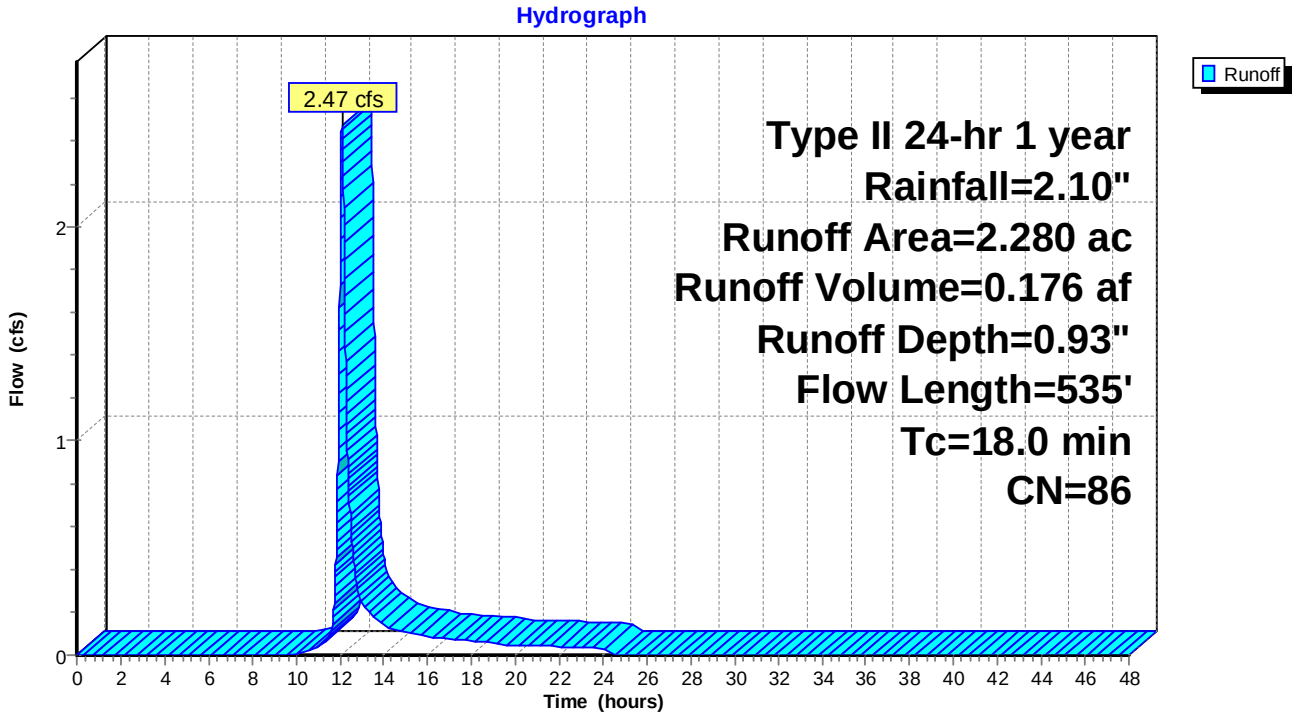
Runoff = 2.47 cfs @ 12.10 hrs, Volume= 0.176 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.890	98	Impervious
*	0.610	77	Grass HSG C/D
*	0.780	80	Grass HSG D
	2.280	86	Weighted Average
	1.390		60.96% Pervious Area
	0.890		39.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0260	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.20"
0.4	55	0.0260	2.42		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.1	380	0.0420	3.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.0	535	Total			

Subcatchment 6S: DA 4a



Summary for Subcatchment 9S: DA 3 as built

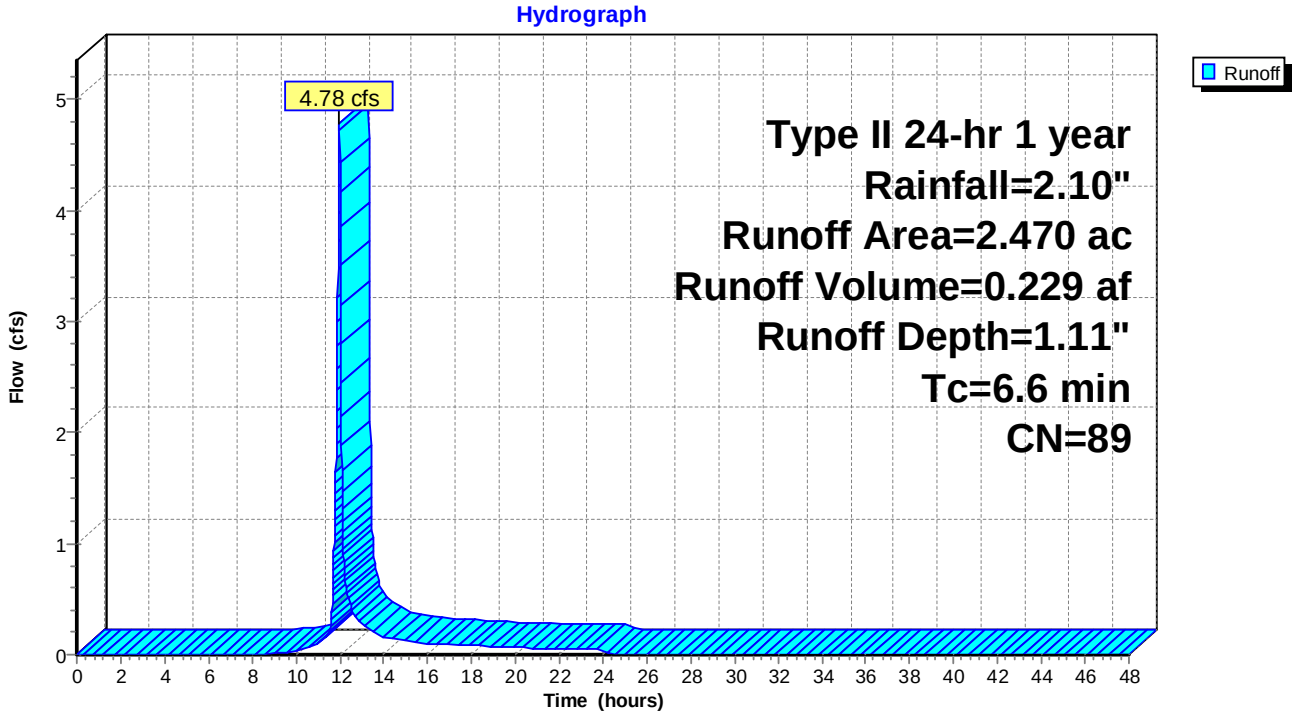
Runoff = 4.78 cfs @ 11.98 hrs, Volume= 0.229 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	1.360	98	
*	1.110	77	
	2.470	89	Weighted Average
	1.110		44.94% Pervious Area
	1.360		55.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6					**Direct Entry,**

Subcatchment 9S: DA 3 as built



Summary for Pond 4P: CPv

Inflow Area = 4.010 ac, 30.92% Impervious, Inflow Depth = 0.87" for 1 year event
Inflow = 3.70 cfs @ 11.94 hrs, Volume= 0.291 af
Outflow = 0.13 cfs @ 17.12 hrs, Volume= 0.266 af, Atten= 97%, Lag= 311.2 min
Primary = 0.13 cfs @ 17.12 hrs, Volume= 0.266 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 480.90' @ 17.12 hrs Surf.Area= 0.210 ac Storage= 0.189 af

Plug-Flow detention time= 771.9 min calculated for 0.266 af (91% of inflow)
Center-of-Mass det. time= 726.9 min (1,575.5 - 848.6)

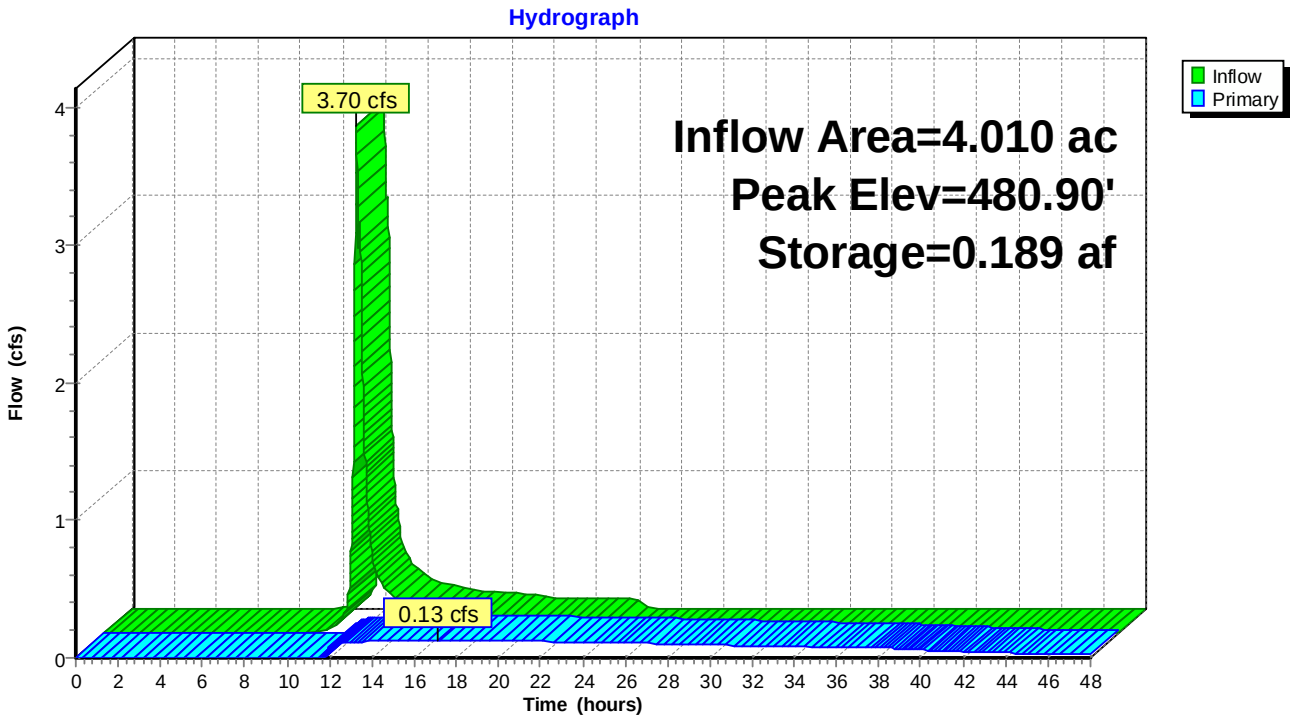
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.420 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.210	0.000	0.000
481.00	0.210	0.210	0.210
482.00	0.210	0.210	0.420

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.75' S= 0.0250 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.13 cfs @ 17.12 hrs HW=480.90' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.13 cfs @ 2.55 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
3.70 cfs
0.13 cfs
Inflow Area=4.010 ac
Peak Elev=480.90'
Storage=0.189 af
Flow (cfs)
Time (hours)
0
1
2
3
4
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 5P: CPv

Inflow Area = 1.370 ac, 71.53% Impervious, Inflow Depth = 1.41" for 1 year event
Inflow = 3.33 cfs @ 11.97 hrs, Volume= 0.161 af
Outflow = 0.14 cfs @ 13.32 hrs, Volume= 0.125 af, Atten= 96%, Lag= 80.7 min
Primary = 0.14 cfs @ 13.32 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 481.04' @ 13.32 hrs Surf.Area= 0.100 ac Storage= 0.104 af

Plug-Flow detention time= 811.9 min calculated for 0.125 af (78% of inflow)
Center-of-Mass det. time= 726.1 min (1,531.1 - 805.1)

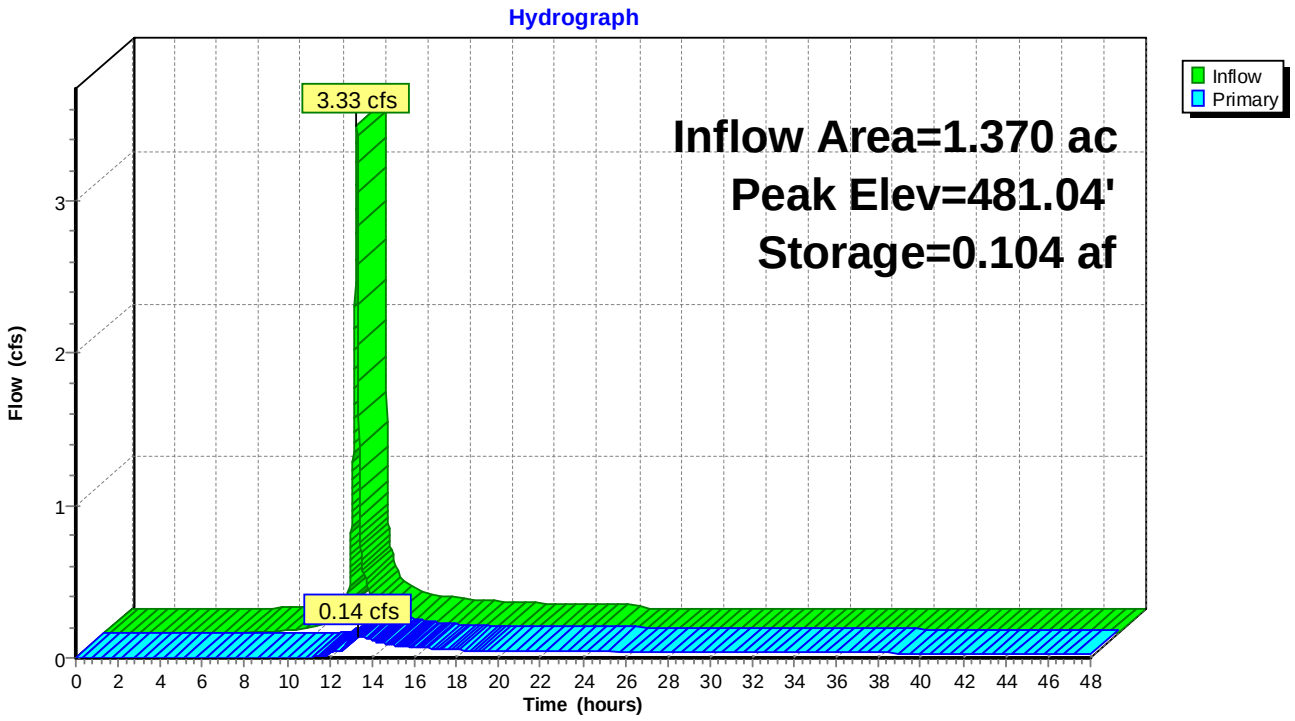
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.200 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.100	0.000	0.000
481.00	0.100	0.100	0.100
482.00	0.100	0.100	0.200

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.14 cfs @ 13.32 hrs HW=481.04' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.04 cfs @ 1.99 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.47 fps)

Pond 5P: CPv


Hydrograph
Inflow
Primary
3.33 cfs
0.14 cfs
Inflow Area=1.370 ac
Peak Elev=481.04'
Storage=0.104 af
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond 6P: CPv

Inflow Area = 2.470 ac, 55.06% Impervious, Inflow Depth = 1.11" for 1 year event
Inflow = 4.78 cfs @ 11.98 hrs, Volume= 0.229 af
Outflow = 0.05 cfs @ 21.67 hrs, Volume= 0.147 af, Atten= 99%, Lag= 581.1 min
Primary = 0.05 cfs @ 21.67 hrs, Volume= 0.147 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 480.98' @ 21.67 hrs Surf.Area= 0.180 ac Storage= 0.176 af

Plug-Flow detention time= 1,033.7 min calculated for 0.147 af (64% of inflow)
Center-of-Mass det. time= 923.2 min (1,749.7 - 826.4)

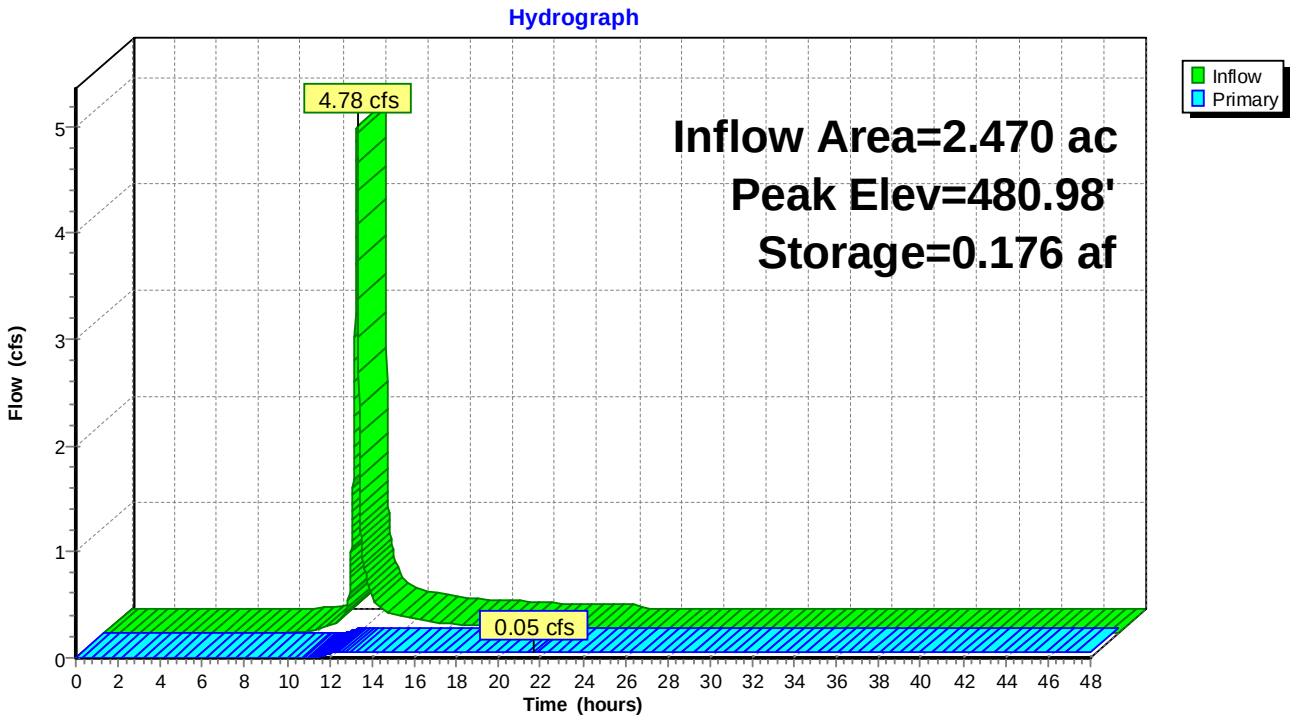
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.360 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.180	0.000	0.000
481.00	0.180	0.180	0.180
482.00	0.180	0.180	0.360

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.05 cfs @ 21.67 hrs HW=480.98' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.05 cfs @ 2.44 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: CPv


Hydrograph
Inflow
Primary
4.78 cfs
0.05 cfs
Inflow Area=2.470 ac
Peak Elev=480.98'
Storage=0.176 af
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

SOUTH RIDGE: PERMIT 1-0664

Source: USGS
Source: NASA, NGA, USGS
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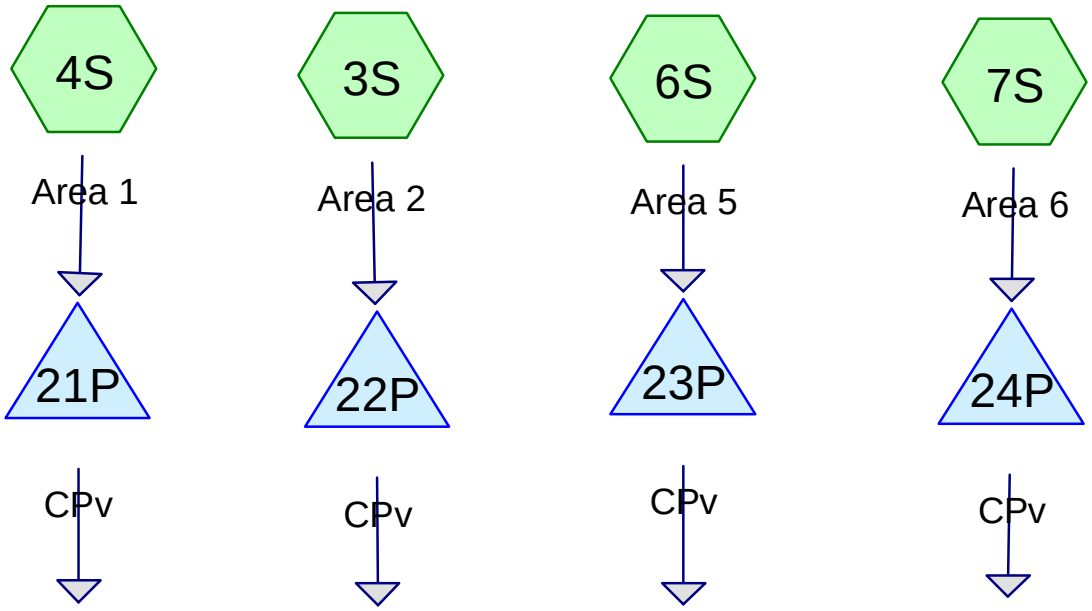

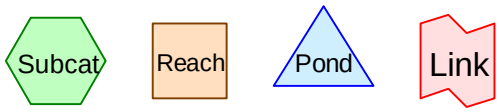

Drainage Diagram for 1-0664-D&K
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Summary for Subcatchment 3S: Area 2

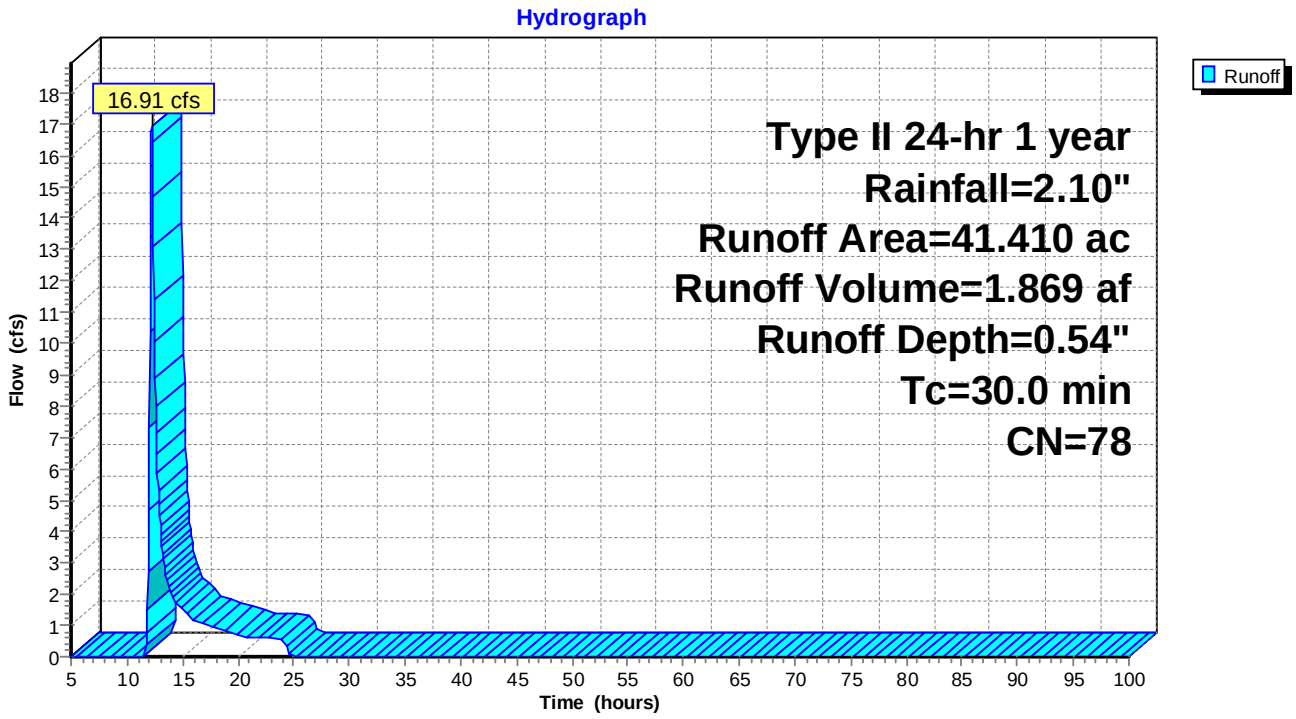
Runoff = 16.91 cfs @ 12.28 hrs, Volume= 1.869 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	41.410	78	
	41.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0					**Direct Entry,**

Subcatchment 3S: Area 2



Summary for Subcatchment 4S: Area 1

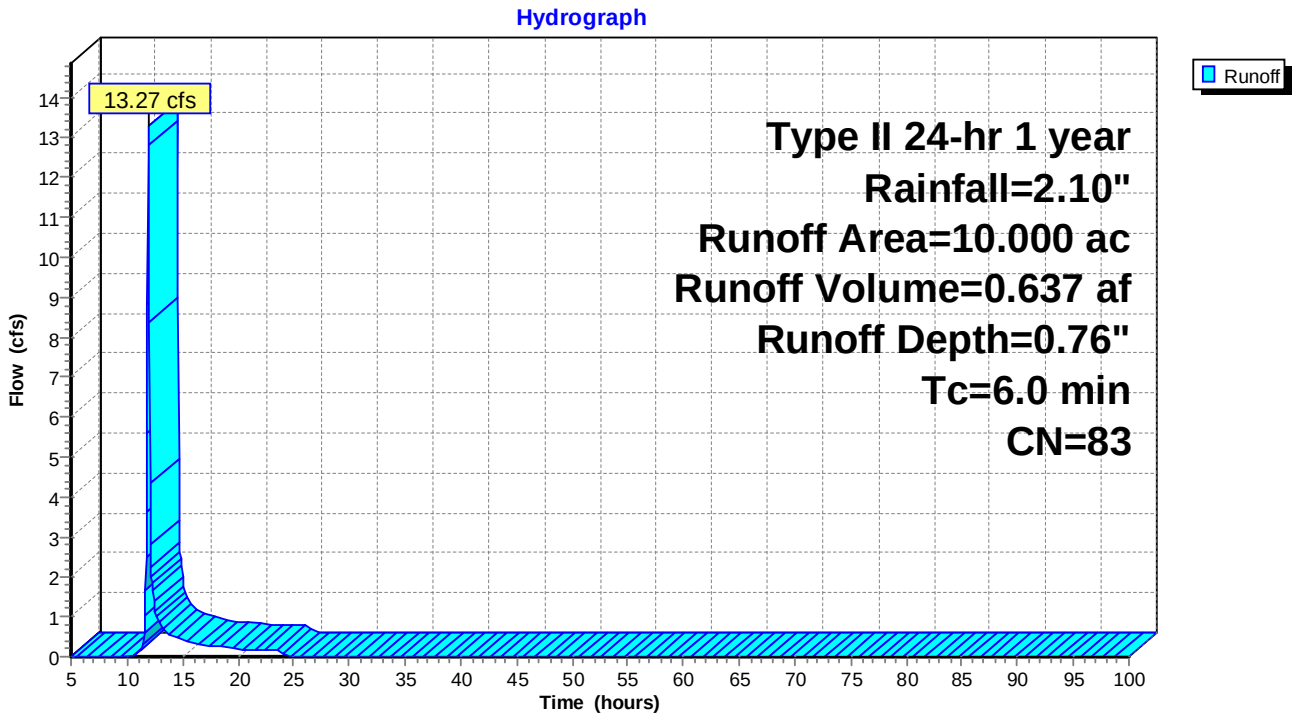
Runoff = 13.27 cfs @ 11.98 hrs, Volume= 0.637 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	10.000	83	
	10.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: Area 1



Summary for Subcatchment 6S: Area 5

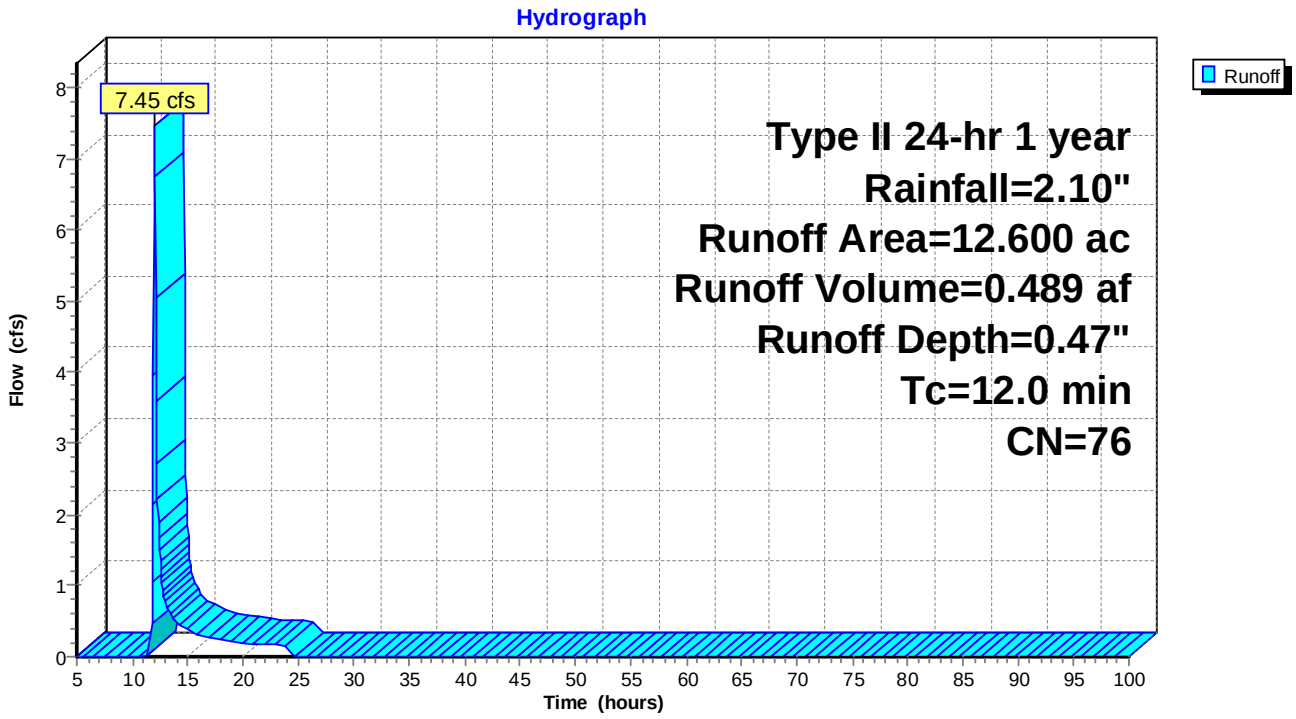
Runoff = 7.45 cfs @ 12.06 hrs, Volume= 0.489 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	12.600	76	
	12.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry, from permit**

Subcatchment 6S: Area 5



Summary for Subcatchment 7S: Area 6

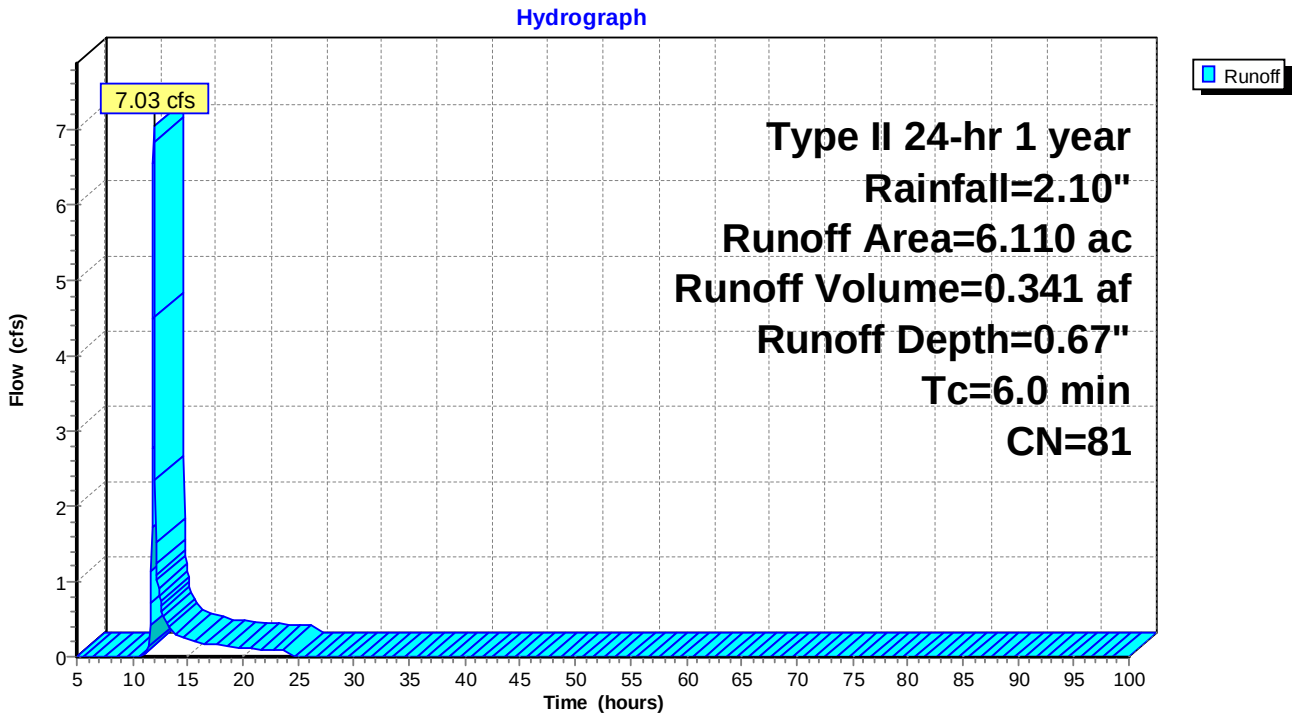
Runoff = 7.03 cfs @ 11.98 hrs, Volume= 0.341 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	6.110	81	
	6.110		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, from permit**

Subcatchment 7S: Area 6



Summary for Pond 21P: CPv

Inflow Area = 10.000 ac, 0.00% Impervious, Inflow Depth = 0.76" for 1 year event
Inflow = 13.27 cfs @ 11.98 hrs, Volume= 0.637 af
Outflow = 0.27 cfs @ 17.60 hrs, Volume= 0.619 af, Atten= 98%, Lag= 337.5 min
Primary = 0.27 cfs @ 17.60 hrs, Volume= 0.619 af

Routing by Stor-Ind method, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 410.82' @ 17.60 hrs Surf.Area= 0.500 ac Storage= 0.408 af

Plug-Flow detention time= 896.7 min calculated for 0.619 af (97% of inflow)
Center-of-Mass det. time= 880.6 min (1,732.2 - 851.5)

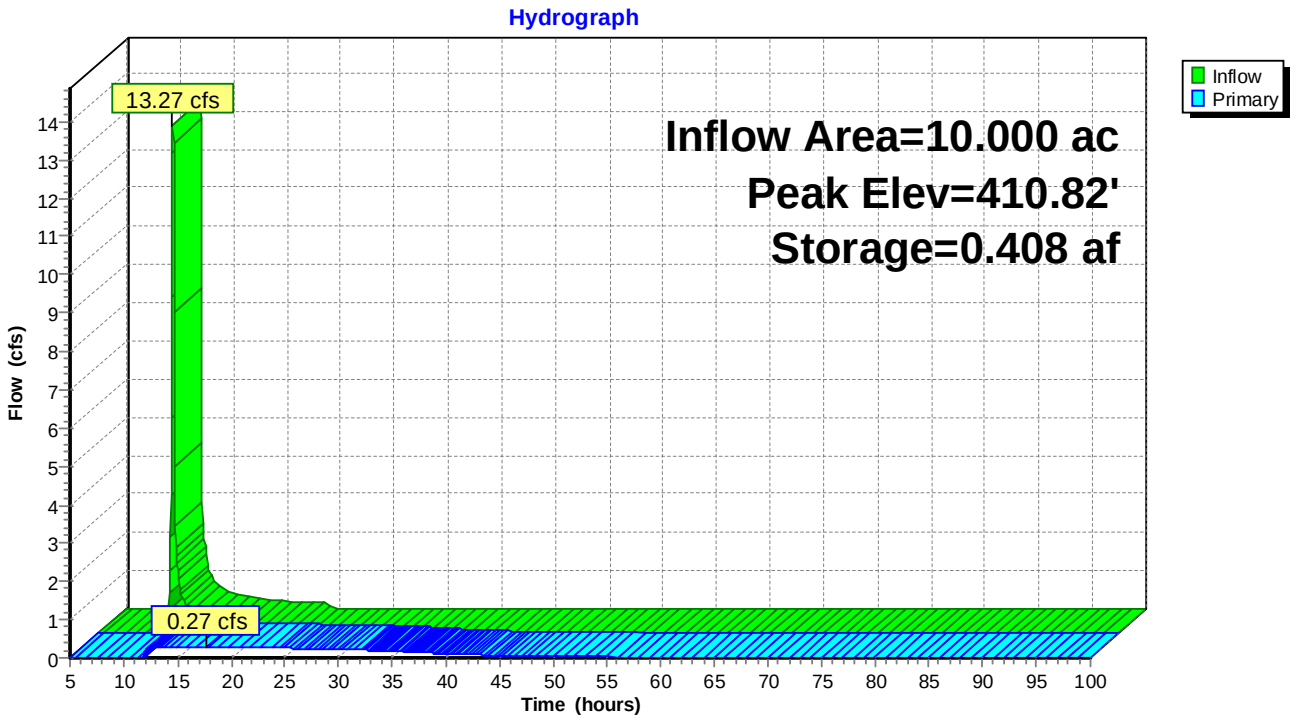
Volume	Invert	Avail.Storage	Storage Description
#1	410.00'	1.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
410.00	0.500	0.000	0.000
411.00	0.500	0.500	0.500
412.00	0.500	0.500	1.000

Device	Routing	Invert	Outlet Devices
#1	Primary	410.00'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	411.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.27 cfs @ 17.60 hrs HW=410.82' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.27 cfs @ 3.12 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 21P: CPv


Hydrograph
Inflow
Primary
13.27 cfs
0.27 cfs
Inflow Area=10.000 ac
Peak Elev=410.82'
Storage=0.408 af
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100

Summary for Pond 22P: CPv

Inflow Area = 41.410 ac, 0.00% Impervious, Inflow Depth = 0.54" for 1 year event
Inflow = 16.91 cfs @ 12.28 hrs, Volume= 1.869 af
Outflow = 0.74 cfs @ 19.62 hrs, Volume= 1.781 af, Atten= 96%, Lag= 440.7 min
Primary = 0.74 cfs @ 19.62 hrs, Volume= 1.781 af

Routing by Stor-Ind method, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 410.96' @ 19.62 hrs Surf.Area= 1.250 ac Storage= 1.205 af

Plug-Flow detention time= 1,010.8 min calculated for 1.781 af (95% of inflow)
Center-of-Mass det. time= 985.3 min (1,880.4 - 895.1)

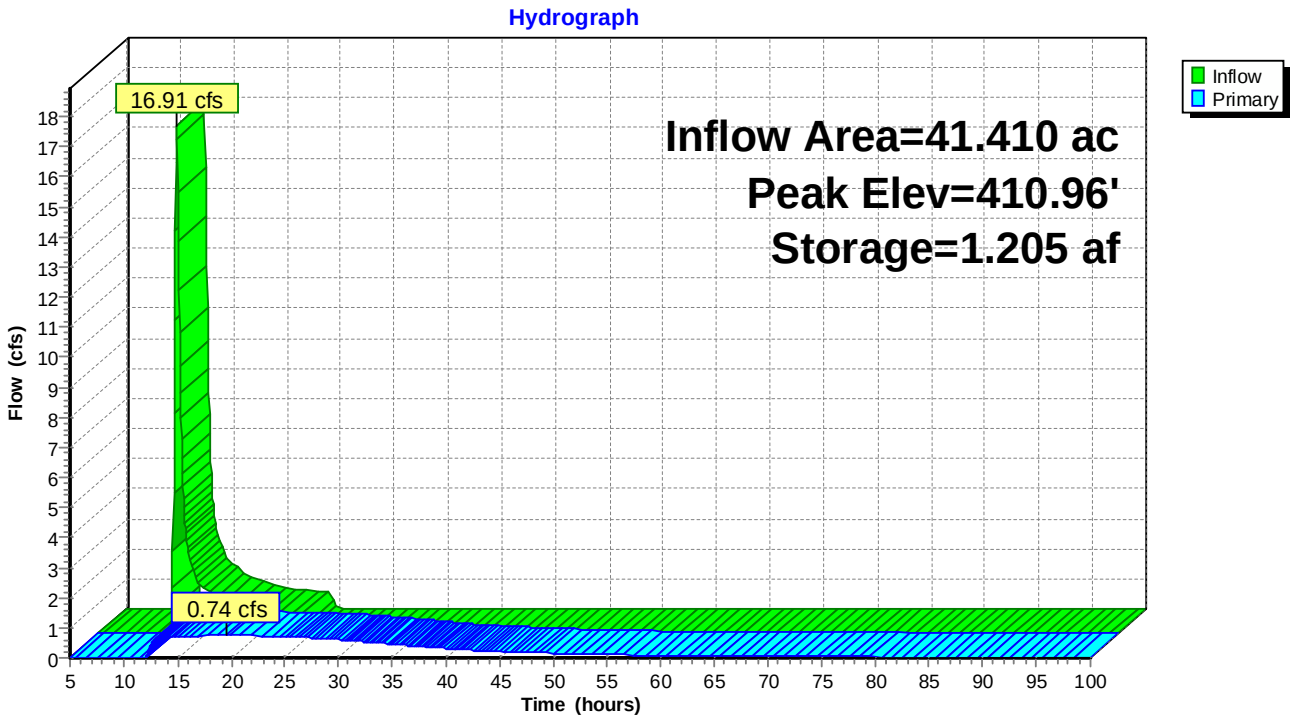
Volume	Invert	Avail.Storage	Storage Description
#1	410.00'	2.500 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
410.00	1.250	0.000	0.000
411.00	1.250	1.250	1.250
412.00	1.250	1.250	2.500

Device	Routing	Invert	Outlet Devices
#1	Primary	410.00'	**6.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	411.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.74 cfs @ 19.62 hrs HW=410.96' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.74 cfs @ 3.75 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 22P: CPv


Hydrograph
16.91 cfs
0.74 cfs
Inflow Area=41.410 ac
Peak Elev=410.96'
Storage=1.205 af
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 23P: CPv

Inflow Area = 12.600 ac, 0.00% Impervious, Inflow Depth = 0.47" for 1 year event
Inflow = 7.45 cfs @ 12.06 hrs, Volume= 0.489 af
Outflow = 0.24 cfs @ 18.32 hrs, Volume= 0.473 af, Atten= 97%, Lag= 375.5 min
Primary = 0.24 cfs @ 18.32 hrs, Volume= 0.473 af

Routing by Stor-Ind method, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 410.57' @ 18.32 hrs Surf.Area= 0.500 ac Storage= 0.286 af

Plug-Flow detention time= 795.5 min calculated for 0.472 af (97% of inflow)
Center-of-Mass det. time= 779.0 min (1,666.7 - 887.8)

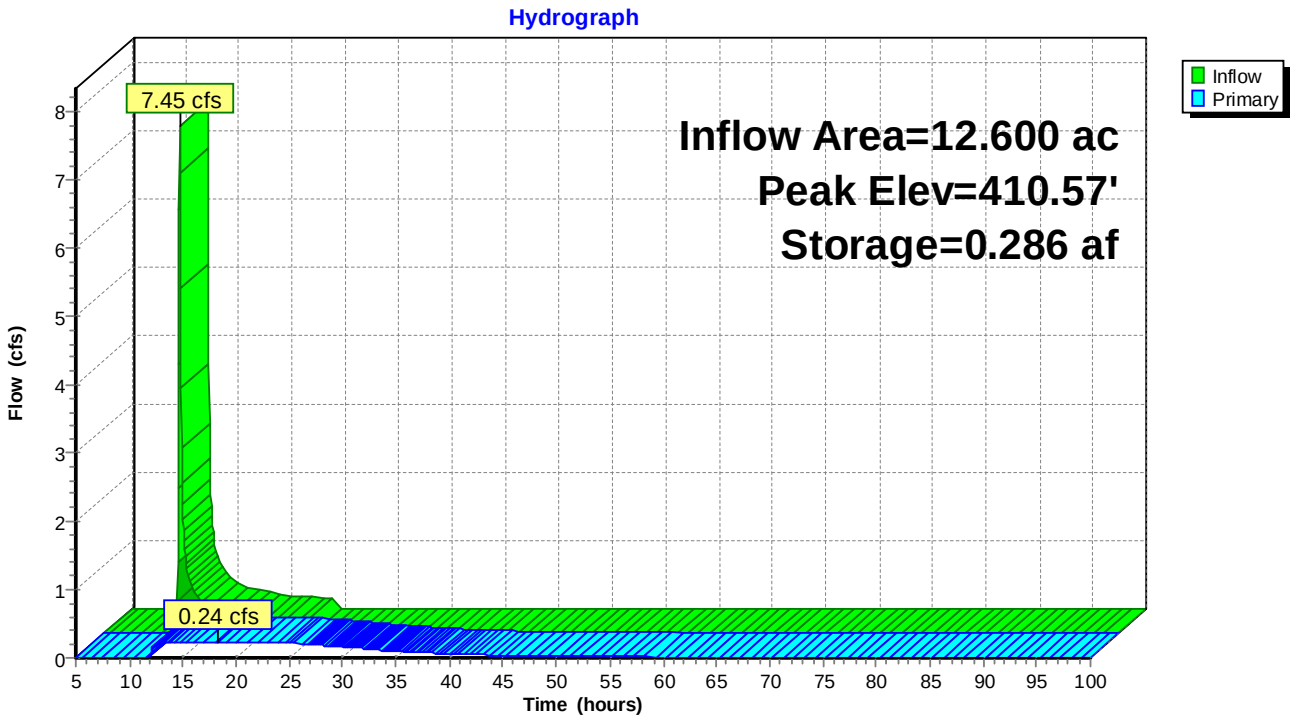
Volume	Invert	Avail.Storage	Storage Description
#1	410.00'	1.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
410.00	0.500	0.000	0.000
411.00	0.500	0.500	0.500
412.00	0.500	0.500	1.000

Device	Routing	Invert	Outlet Devices
#1	Primary	410.00'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	411.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.24 cfs @ 18.32 hrs HW=410.57' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.24 cfs @ 2.70 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 23P: CPv


Hydrograph
Inflow
Primary
7.45 cfs
0.24 cfs
Inflow Area=12.600 ac
Peak Elev=410.57'
Storage=0.286 af
Flow (cfs)
0
1
2
3
4
5
6
7
8
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Time (hours)

Summary for Pond 24P: CPv

Inflow Area = 6.110 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1 year event
Inflow = 7.03 cfs @ 11.98 hrs, Volume= 0.341 af
Outflow = 0.14 cfs @ 18.23 hrs, Volume= 0.335 af, Atten= 98%, Lag= 375.2 min
Primary = 0.14 cfs @ 18.23 hrs, Volume= 0.335 af

Routing by Stor-Ind method, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 410.90' @ 18.23 hrs Surf.Area= 0.240 ac Storage= 0.217 af

Plug-Flow detention time= 866.3 min calculated for 0.335 af (98% of inflow)
Center-of-Mass det. time= 857.6 min (1,717.4 - 859.8)

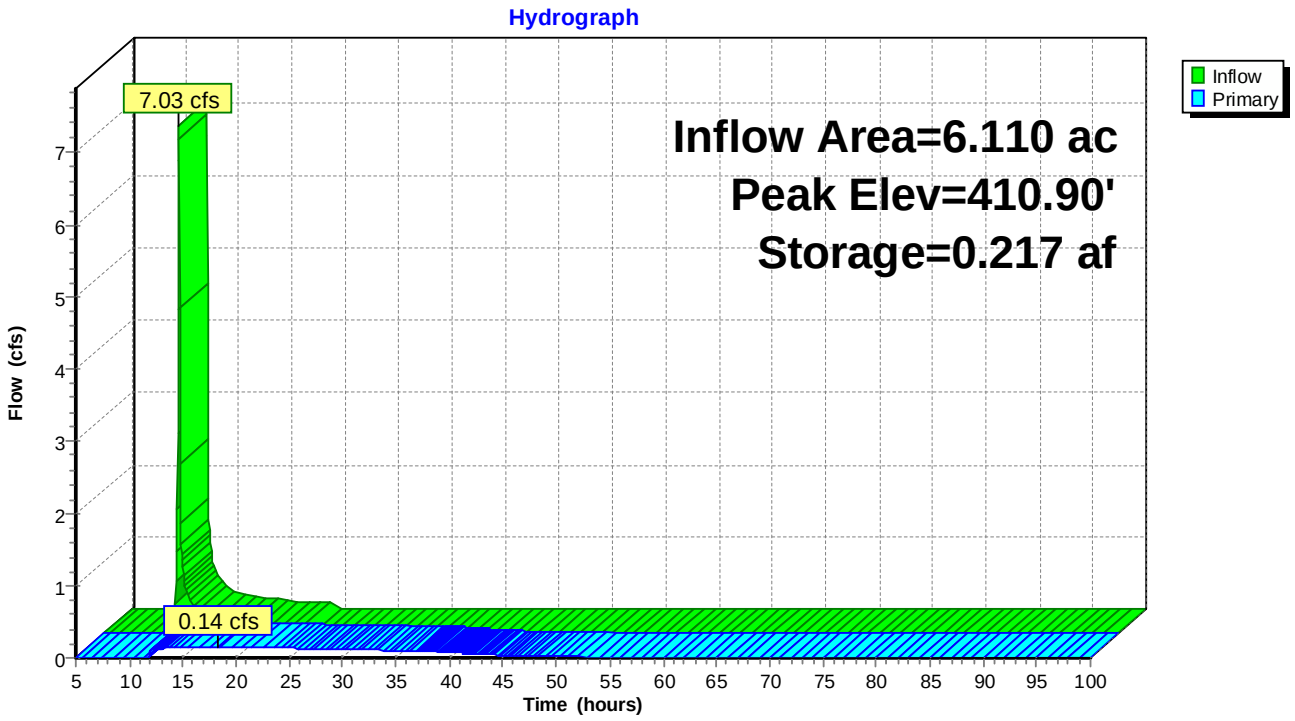
Volume	Invert	Avail.Storage	Storage Description
#1	410.00'	0.480 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
410.00	0.240	0.000	0.000
411.00	0.240	0.240	0.240
412.00	0.240	0.240	0.480

Device	Routing	Invert	Outlet Devices
#1	Primary	410.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 410.00' / 409.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	411.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.14 cfs @ 18.23 hrs HW=410.90' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.14 cfs @ 2.89 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 24P: CPv


Hydrograph
Inflow
Primary
7.03 cfs
0.14 cfs
Inflow Area=6.110 ac
Peak Elev=410.90'
Storage=0.217 af
Flow (cfs)
0
1
2
3
4
5
6
7
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Time (hours)

TURTLE CROSSING: PERMIT 1-0792

Source: USGS
Source: NASA, NGA, USGS
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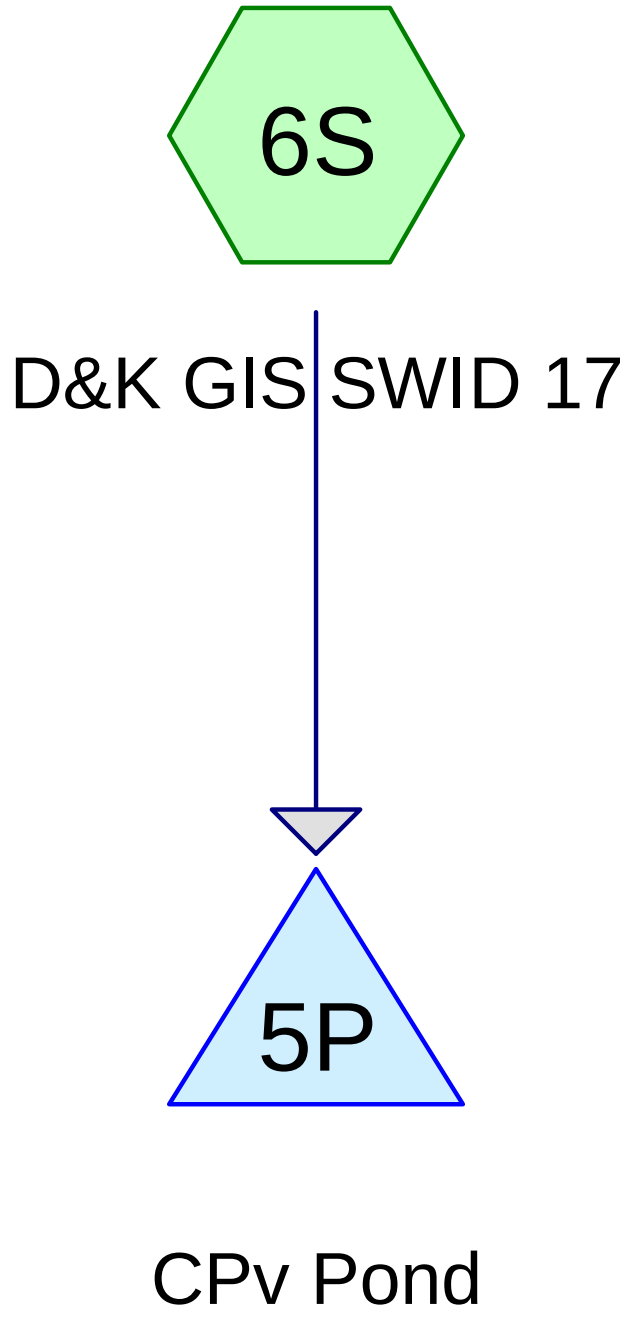
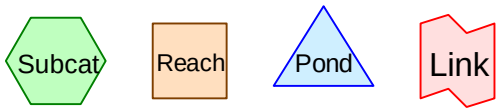




Drainage Diagram for 1-0792- D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
HydroCAD® 9.10 s/n 02762 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 6S: D&K GIS SWID 17

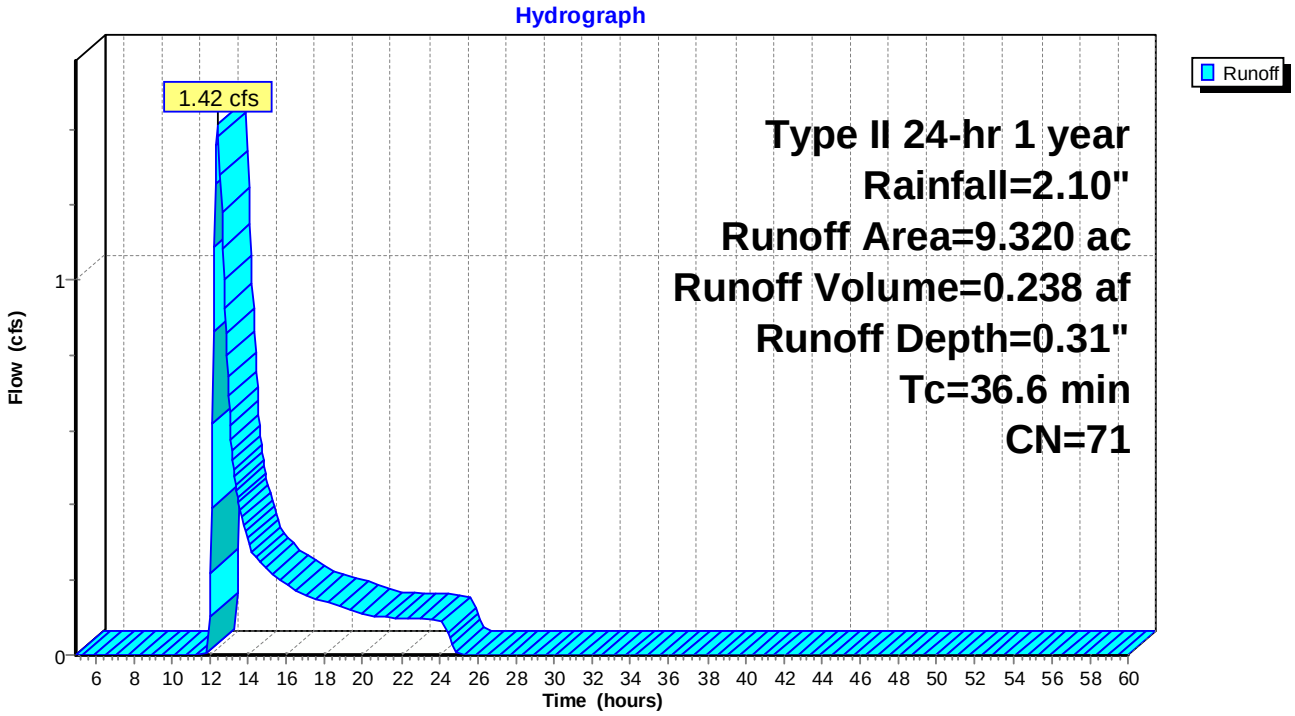
Runoff = 1.42 cfs @ 12.42 hrs, Volume= 0.238 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
2.500	54	1/2 acre lots, 25% imp, HSG A
2.500	70	1/2 acre lots, 25% imp, HSG B
3.980	80	1/2 acre lots, 25% imp, HSG C
0.340	85	1/2 acre lots, 25% imp, HSG D
9.320	71	Weighted Average
6.990		75.00% Pervious Area
2.330		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.6					**Direct Entry, Permit Tc**

Subcatchment 6S: D&K GIS SWID 17



Summary for Pond 5P: CPv Pond

Inflow Area = 9.320 ac, 25.00% Impervious, Inflow Depth = 0.31" for 1 year event
Inflow = 1.42 cfs @ 12.42 hrs, Volume= 0.238 af
Outflow = 0.11 cfs @ 20.15 hrs, Volume= 0.220 af, Atten= 92%, Lag= 464.0 min
Primary = 0.11 cfs @ 20.15 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 480.94' @ 20.15 hrs Surf.Area= 0.150 ac Storage= 0.141 af

Plug-Flow detention time= 747.5 min calculated for 0.220 af (93% of inflow)
Center-of-Mass det. time= 709.7 min (1,647.9 - 938.1)

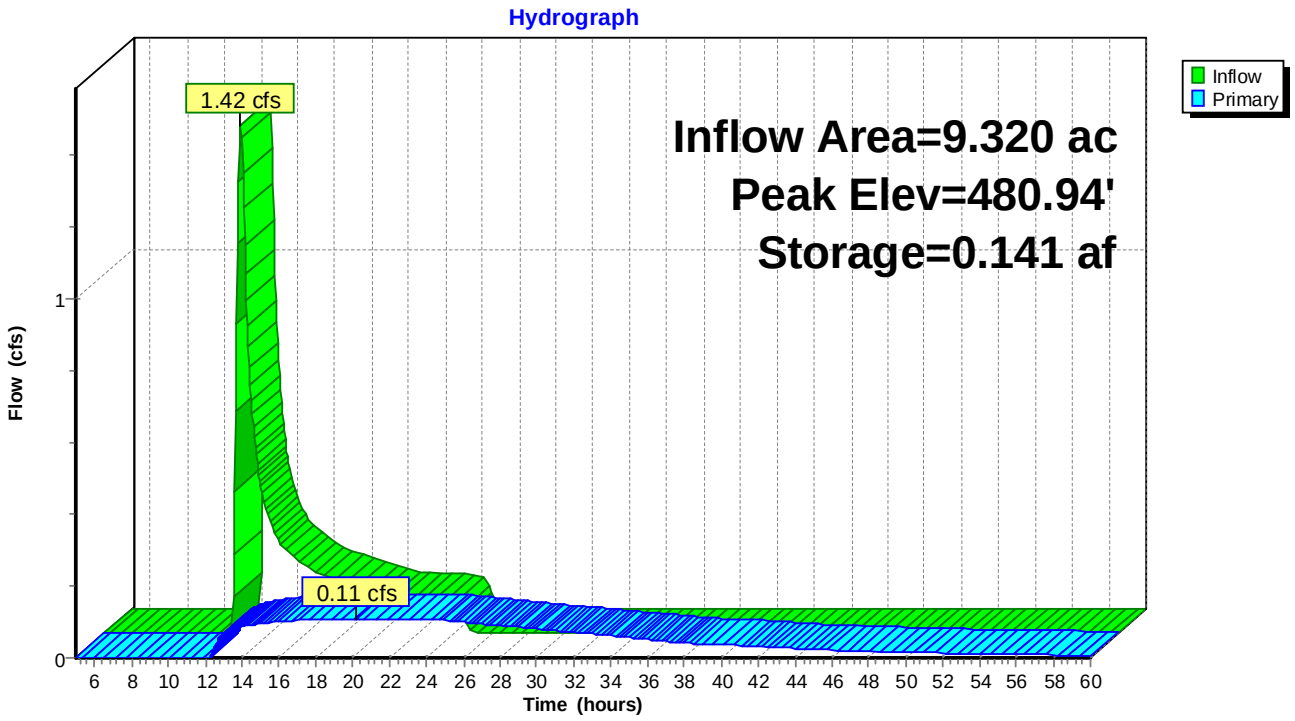
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.300 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.150	0.000	0.000
481.00	0.150	0.150	0.150
482.00	0.150	0.150	0.300

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.11 cfs @ 20.15 hrs HW=480.94' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.11 cfs @ 2.23 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



WILLISTON ELDER HOUSING: PERMIT 1-0963

Source: USGS
Source: NASA, NGA, USGS
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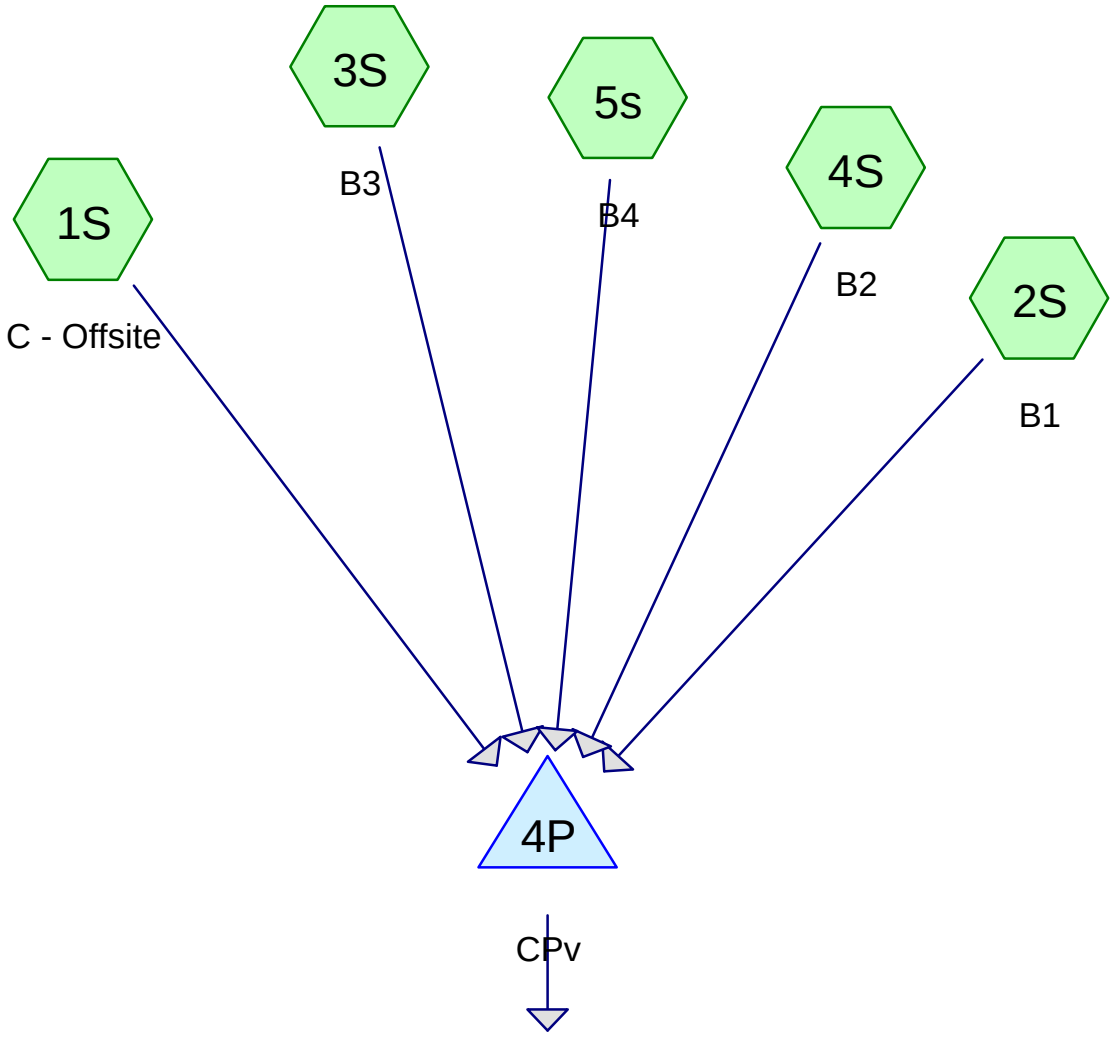

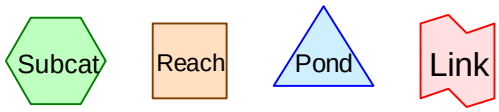

Drainage Diagram for 1-0963 - D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
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Summary for Subcatchment 1S: C - Offsite

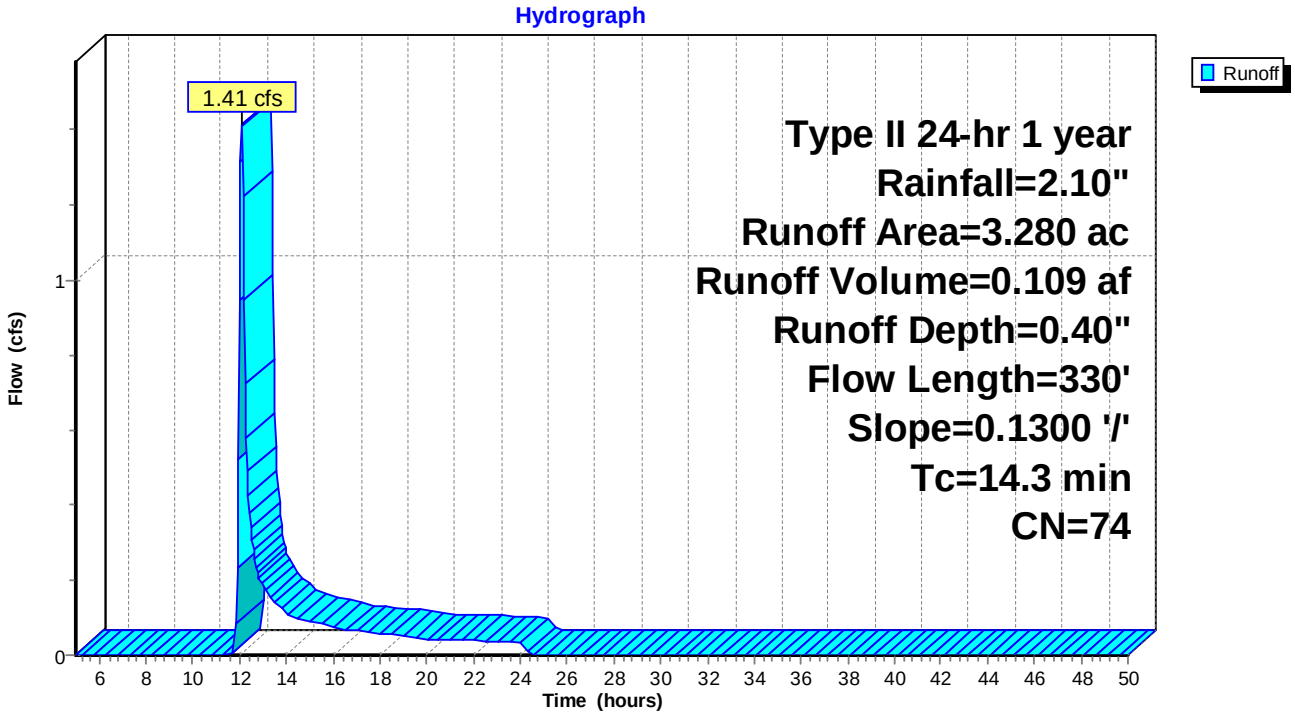
Runoff = 1.41 cfs @ 12.09 hrs, Volume= 0.109 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	3.280	74	
	3.280		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.20"
2.1	230	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	330	Total			

Subcatchment 1S: C - Offsite



Summary for Subcatchment 2S: B1

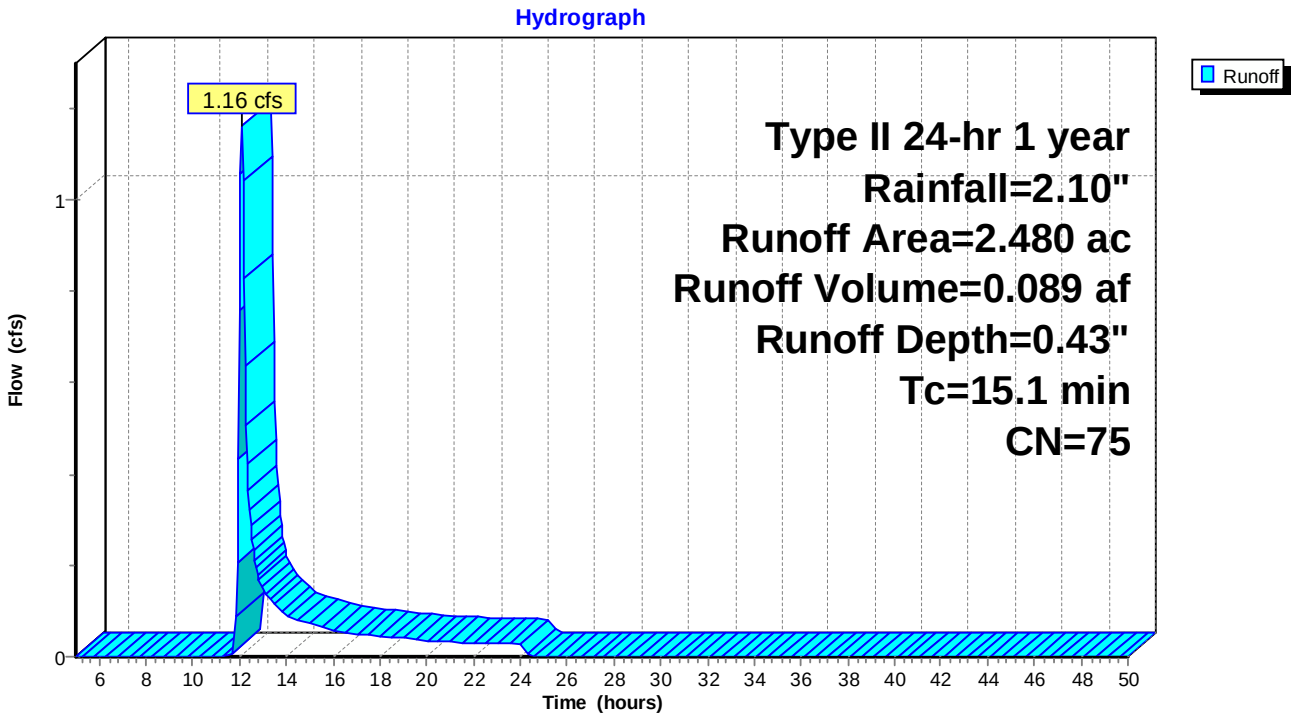
Runoff = 1.16 cfs @ 12.10 hrs, Volume= 0.089 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	2.480	75	
	2.480		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1					**Direct Entry,**

Subcatchment 2S: B1



Summary for Subcatchment 3S: B3

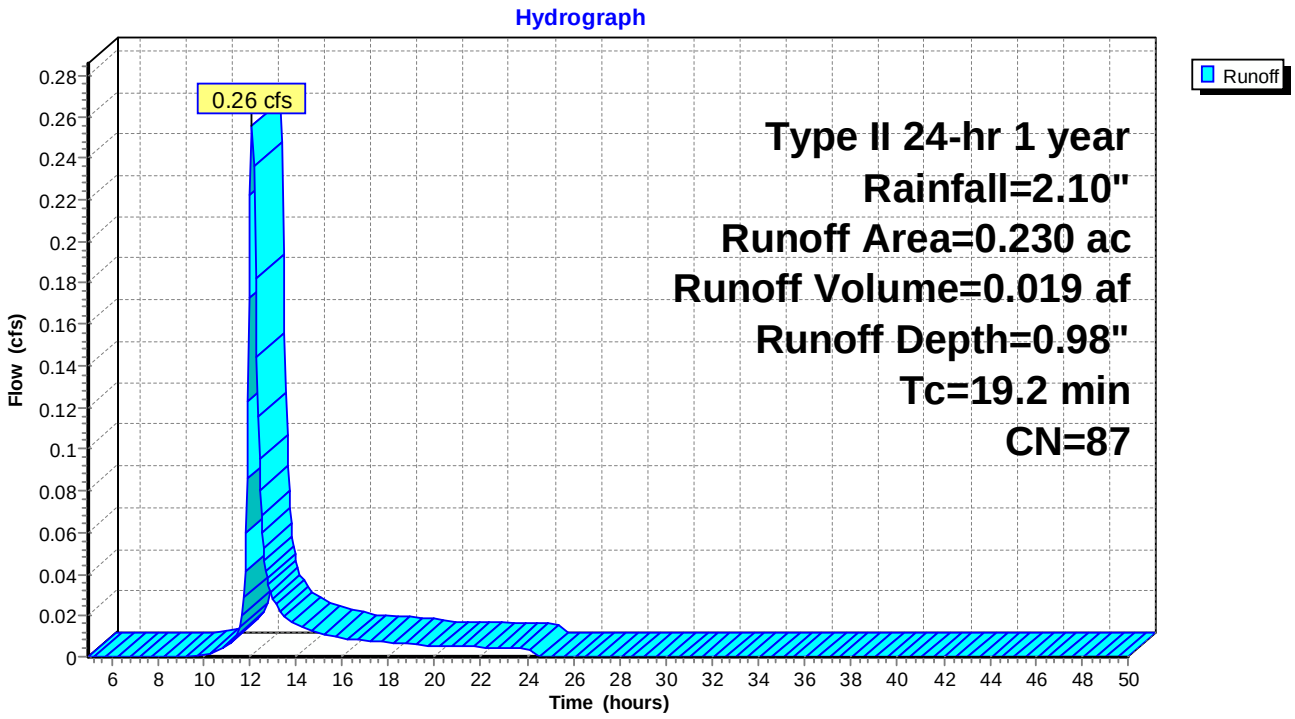
Runoff = 0.26 cfs @ 12.12 hrs, Volume= 0.019 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.230	87	
	0.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2					**Direct Entry,**

Subcatchment 3S: B3



Summary for Subcatchment 4S: B2

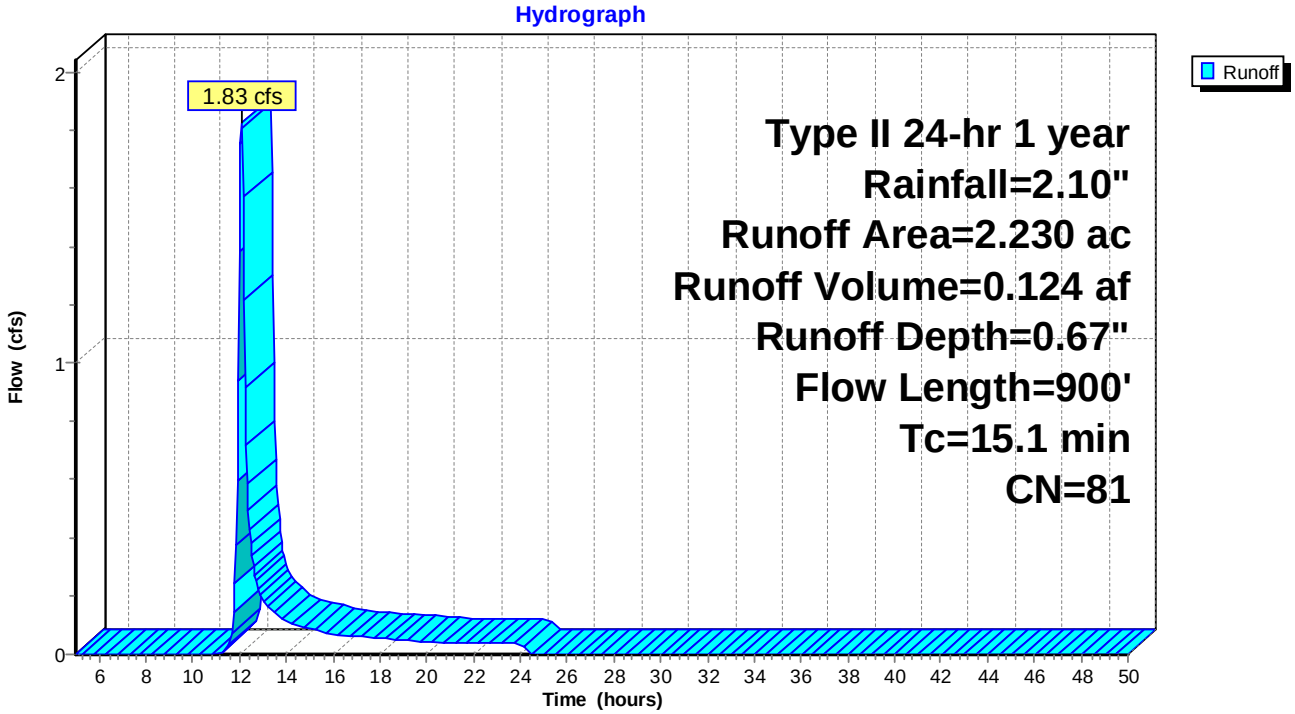
Runoff = 1.83 cfs @ 12.08 hrs, Volume= 0.124 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	2.230	81	
	2.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	100	0.1700	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.20"
1.3	160	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.8	640	0.0200	3.75	36.40	**Channel Flow,** Area= 9.7 sf Perim= 11.5' r= 0.84' n= 0.050
15.1	900	Total			

Subcatchment 4S: B2



Summary for Subcatchment 5s: B4

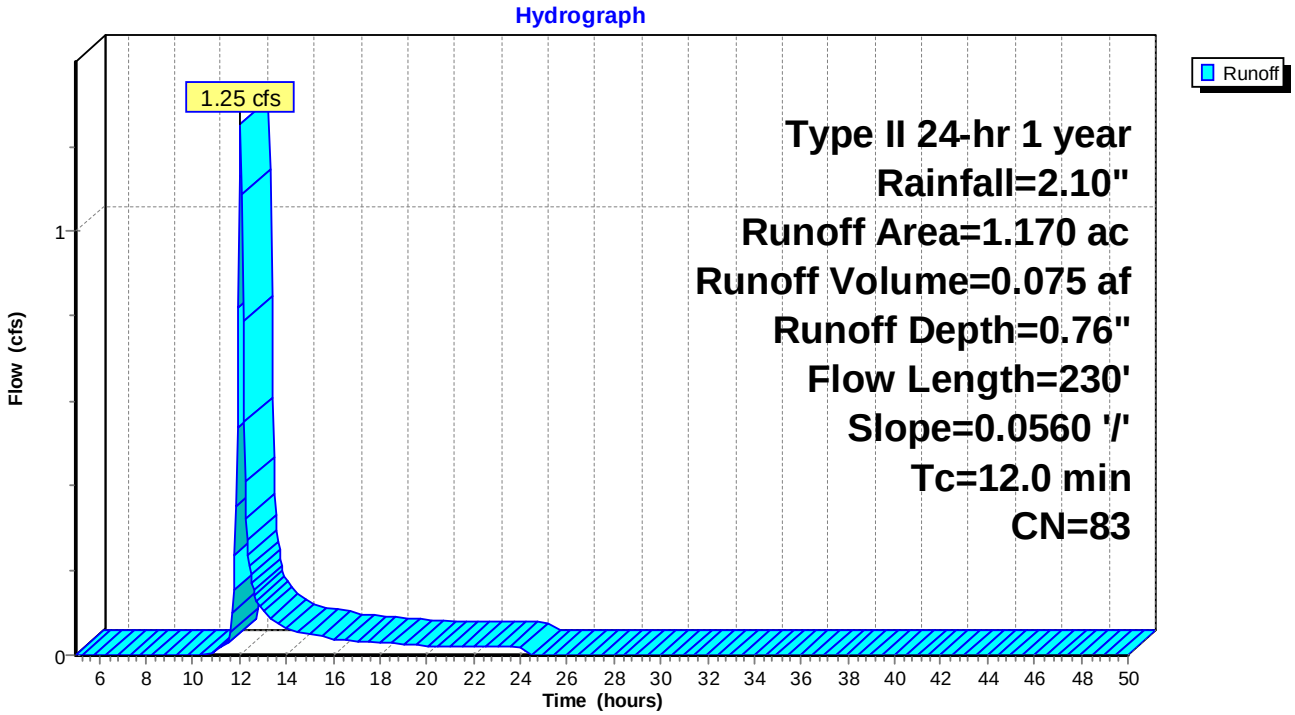
Runoff = 1.25 cfs @ 12.05 hrs, Volume= 0.075 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-50.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	1.170	83	
	1.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0560	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.20"
0.6	130	0.0560	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.0	230	Total			

Subcatchment 5s: B4



Summary for Pond 4P: CPv

Inflow Area = 9.390 ac, 0.00% Impervious, Inflow Depth = 0.53" for 1 year event
Inflow = 5.79 cfs @ 12.08 hrs, Volume= 0.415 af
Outflow = 0.15 cfs @ 20.07 hrs, Volume= 0.370 af, Atten= 97%, Lag= 479.4 min
Primary = 0.15 cfs @ 20.07 hrs, Volume= 0.370 af

Routing by Stor-Ind method, Time Span= 5.00-50.00 hrs, dt= 0.05 hrs
Peak Elev= 480.96' @ 20.07 hrs Surf.Area= 0.290 ac Storage= 0.278 af

Plug-Flow detention time= 901.2 min calculated for 0.370 af (89% of inflow)
Center-of-Mass det. time= 847.6 min (1,727.1 - 879.5)

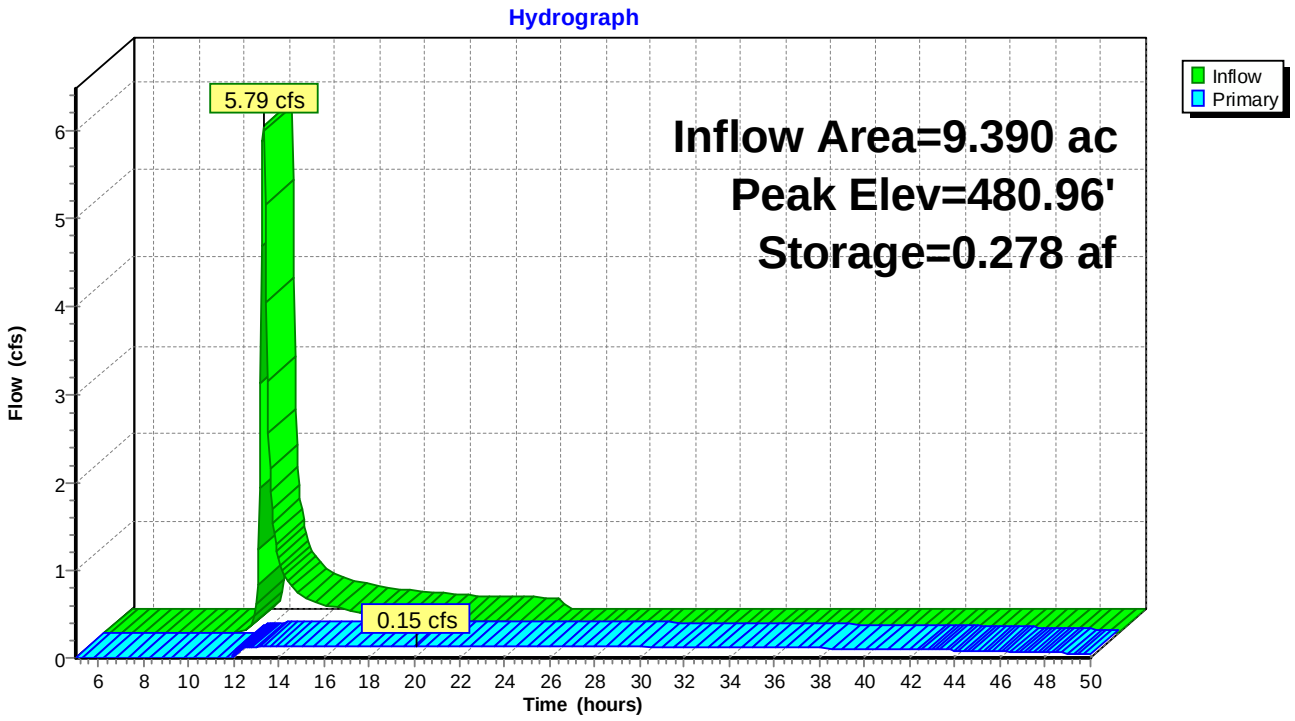
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.580 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.290	0.000	0.000
481.00	0.290	0.290	0.290
482.00	0.290	0.290	0.580

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.15 cfs @ 20.07 hrs HW=480.96' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.15 cfs @ 2.96 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
5.79 cfs
0.15 cfs
Inflow Area=9.390 ac
Peak Elev=480.96'
Storage=0.278 af
Flow (cfs)
0
1
2
3
4
5
6
6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
Time (hours)

TIMOTHY WAY: PERMIT 1-1047

Source: USGS
Source: NASA, NGA, USGS
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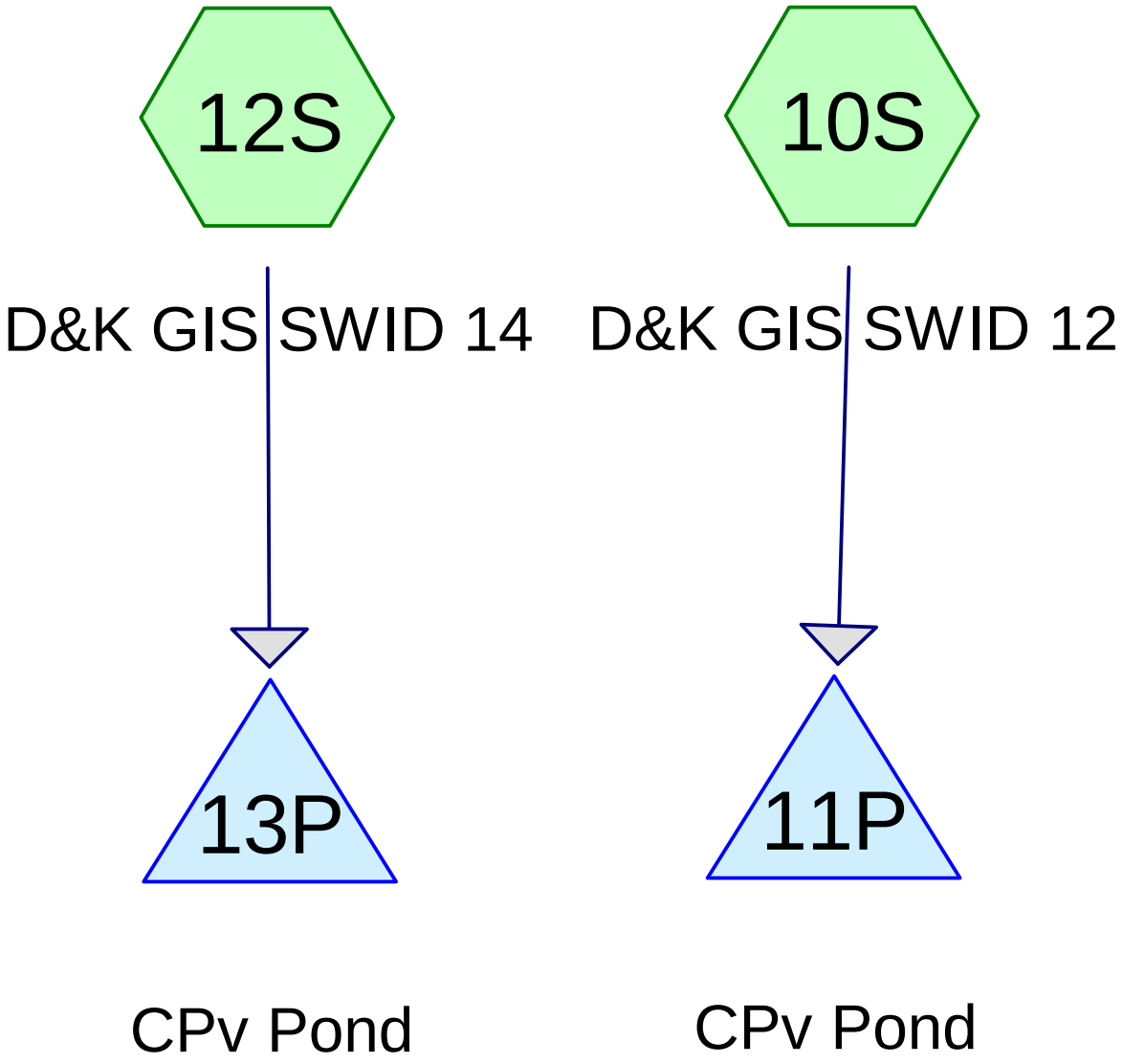

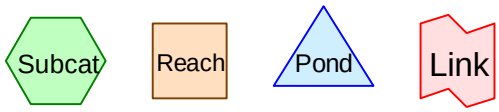

Drainage Diagram for 1-1047- D&K
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Summary for Subcatchment 10S: D&K GIS SWID 12

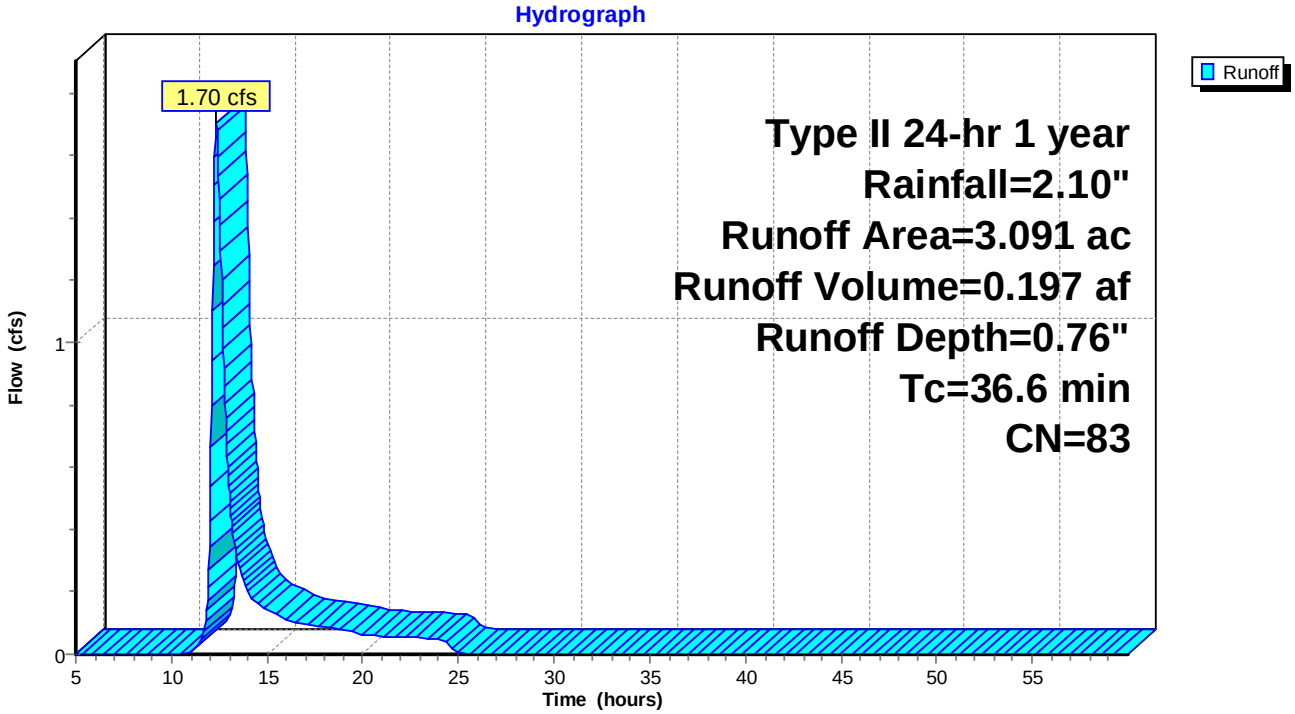
Runoff = 1.70 cfs @ 12.34 hrs, Volume= 0.197 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-59.99 hrs, dt= 0.03 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
3.091	83	1/4 acre lots, 38% imp, HSG C
1.916		62.00% Pervious Area
1.175		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.6					**Direct Entry, Permit Tc**

Subcatchment 10S: D&K GIS SWID 12



Summary for Subcatchment 12S: D&K GIS SWID 14

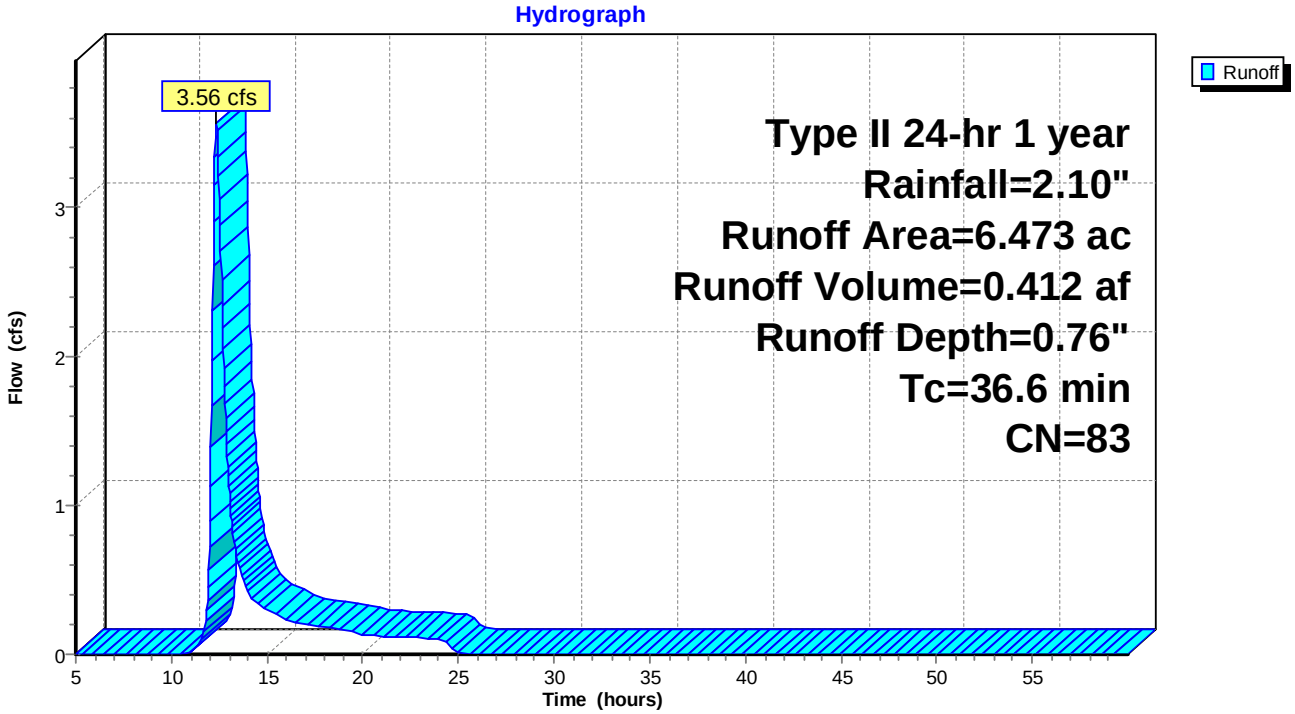
Runoff = 3.56 cfs @ 12.34 hrs, Volume= 0.412 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-59.99 hrs, dt= 0.03 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
6.473	83	1/4 acre lots, 38% imp, HSG C
4.013		62.00% Pervious Area
2.460		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.6					**Direct Entry, Permit Tc**

Subcatchment 12S: D&K GIS SWID 14



Summary for Pond 11P: CPv Pond

Inflow Area = 3.091 ac, 38.00% Impervious, Inflow Depth = 0.76" for 1 year event
Inflow = 1.70 cfs @ 12.34 hrs, Volume= 0.197 af
Outflow = 0.08 cfs @ 18.67 hrs, Volume= 0.186 af, Atten= 95%, Lag= 379.8 min
Primary = 0.08 cfs @ 18.67 hrs, Volume= 0.186 af

Routing by Stor-Ind method, Time Span= 5.00-59.99 hrs, dt= 0.03 hrs
Peak Elev= 480.99' @ 18.67 hrs Surf.Area= 0.130 ac Storage= 0.129 af

Plug-Flow detention time= 897.4 min calculated for 0.186 af (94% of inflow)
Center-of-Mass det. time= 866.8 min (1,746.8 - 879.9)

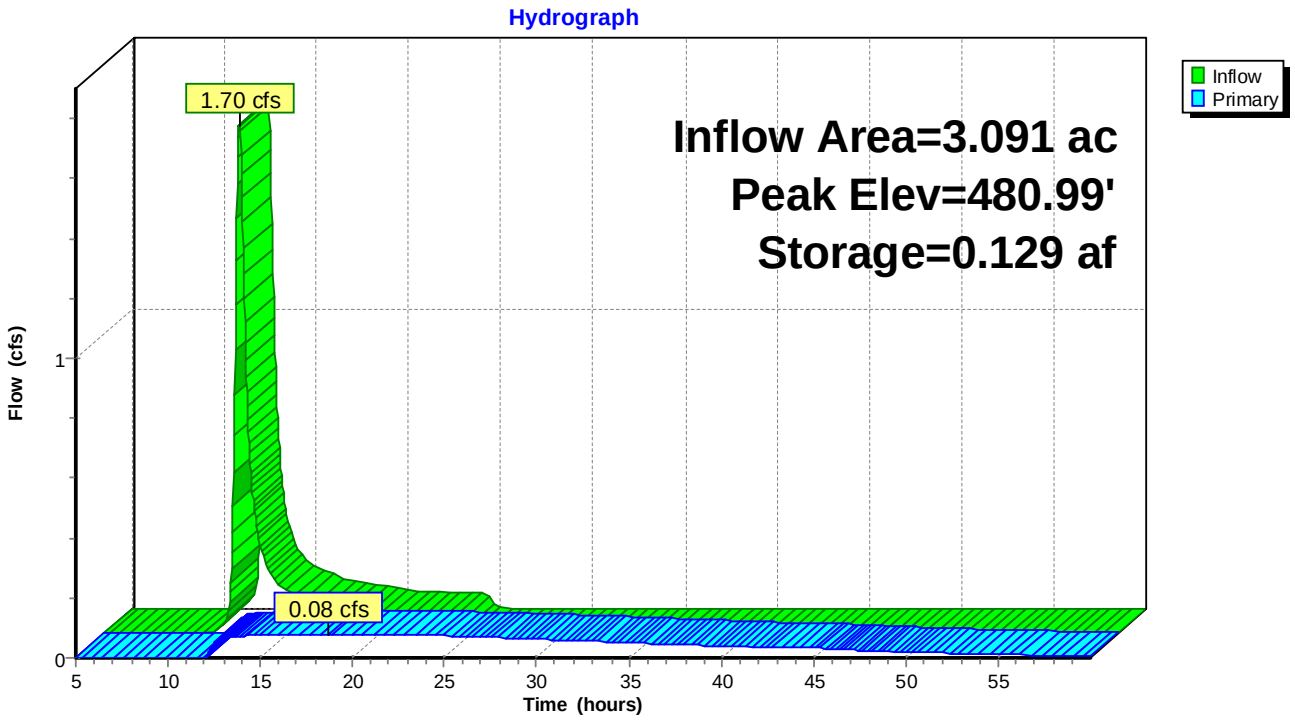
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.260 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.130	0.000	0.000
481.00	0.130	0.130	0.130
482.00	0.130	0.130	0.260

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.5" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.90' S= 0.0100 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.08 cfs @ 18.67 hrs HW=480.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.08 cfs @ 2.29 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: CPv Pond



Summary for Pond 13P: CPv Pond

Inflow Area =	6.473 ac, 38.00% Impervious, Inflow Depth = 0.76" for 1 year event				
Inflow =	3.56 cfs @	12.34 hrs,	Volume=	0.412 af	
Outflow =	0.15 cfs @	19.41 hrs,	Volume=	0.389 af,	Atten= 96%, Lag= 424.0 min
Primary =	0.15 cfs @	19.41 hrs,	Volume=	0.389 af	

Routing by Stor-Ind method, Time Span= 5.00-59.99 hrs, dt= 0.03 hrs
Peak Elev= 480.99' @ 19.41 hrs Surf.Area= 0.280 ac Storage= 0.278 af

Plug-Flow detention time= 950.6 min calculated for 0.389 af (94% of inflow)
Center-of-Mass det. time= 921.0 min (1,800.9 - 879.9)

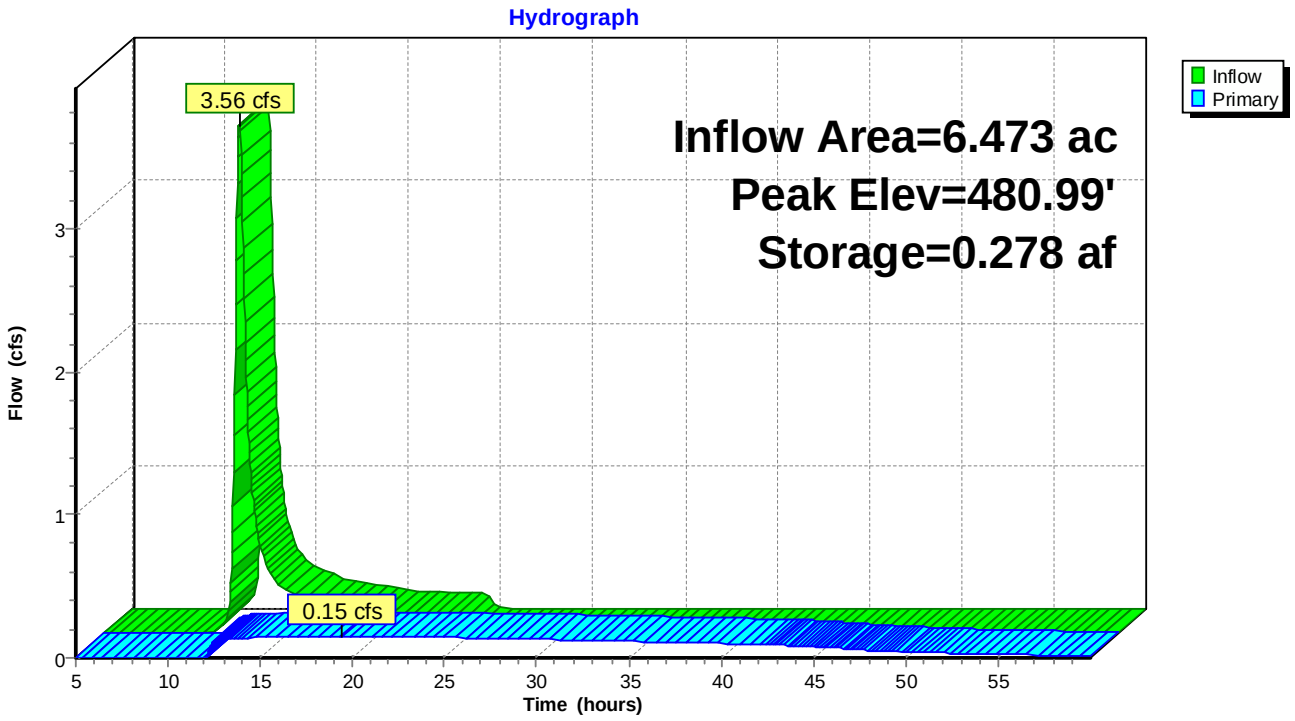
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.560 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.280	0.000	0.000
481.00	0.280	0.280	0.280
482.00	0.280	0.280	0.560

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.15 cfs @ 19.41 hrs HW=480.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.15 cfs @ 3.00 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13P: CPv Pond



COMMONS: PERMIT 1-1052

68m
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Source: USGS
Source: NASA, NGA, USGS
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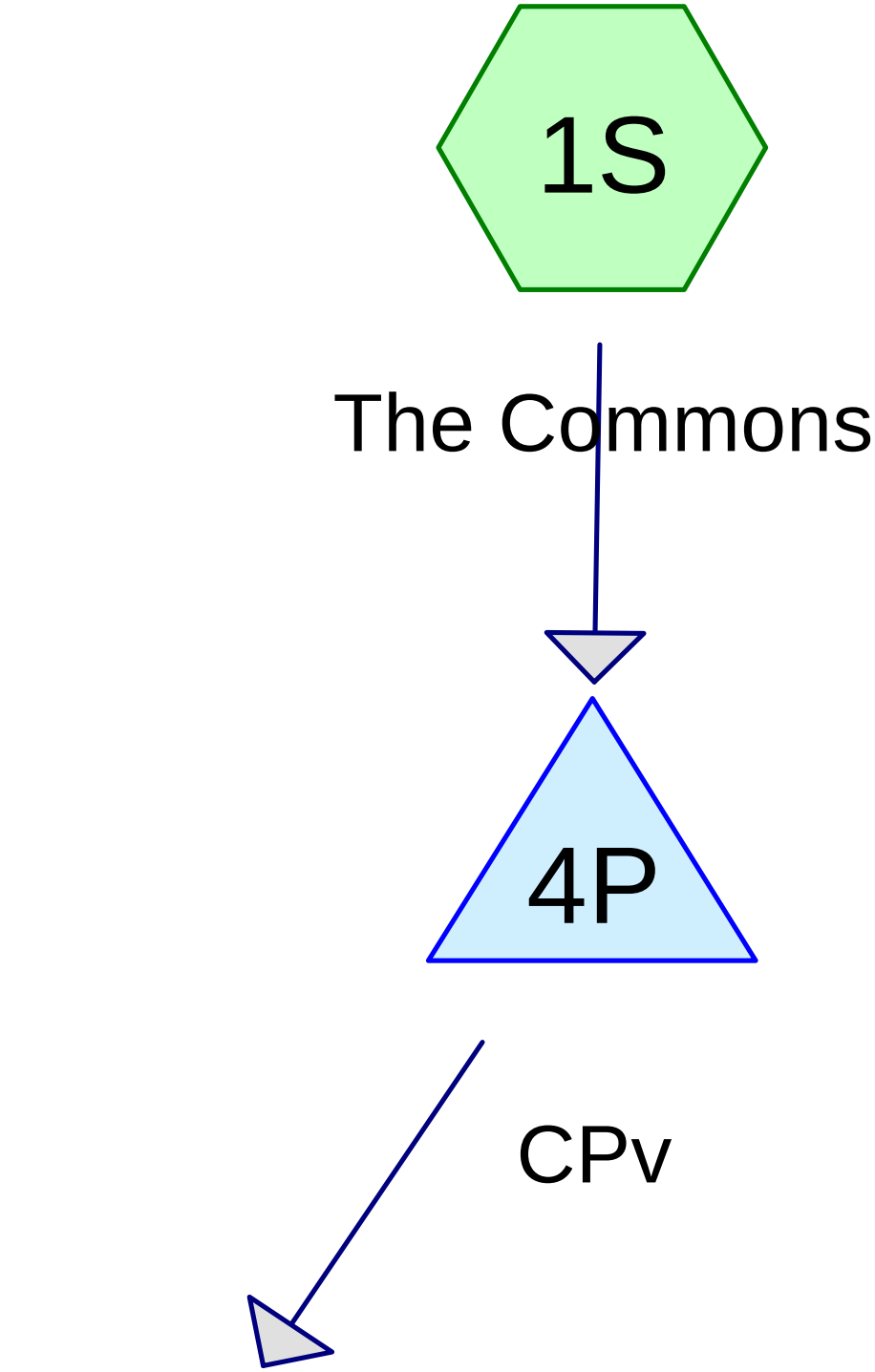

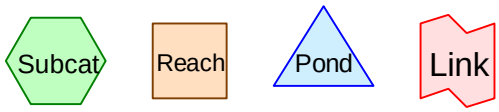

Drainage Diagram for 1-1052-D&K
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Summary for Subcatchment 1S: The Commons

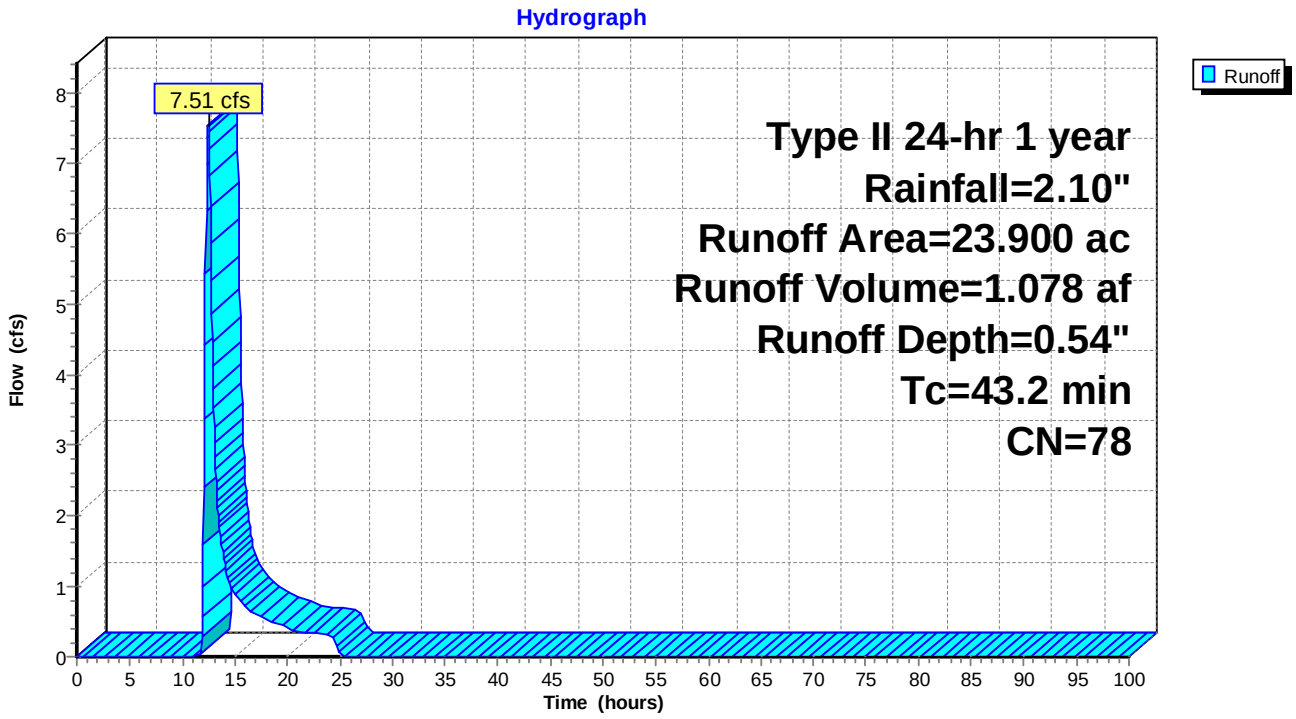
Runoff = 7.51 cfs @ 12.46 hrs, Volume= 1.078 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	23.900	78	
	23.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.2					**Direct Entry,**

Subcatchment 1S: The Commons



Summary for Pond 4P: CPv

Inflow Area = 23.900 ac, 0.00% Impervious, Inflow Depth = 0.54" for 1 year event
Inflow = 7.51 cfs @ 12.46 hrs, Volume= 1.078 af
Outflow = 0.48 cfs @ 18.90 hrs, Volume= 1.048 af, Atten= 94%, Lag= 386.2 min
Primary = 0.48 cfs @ 18.90 hrs, Volume= 1.048 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.94' @ 18.90 hrs Surf.Area= 0.700 ac Storage= 0.658 af

Plug-Flow detention time= 843.7 min calculated for 1.047 af (97% of inflow)
Center-of-Mass det. time= 829.7 min (1,737.0 - 907.3)

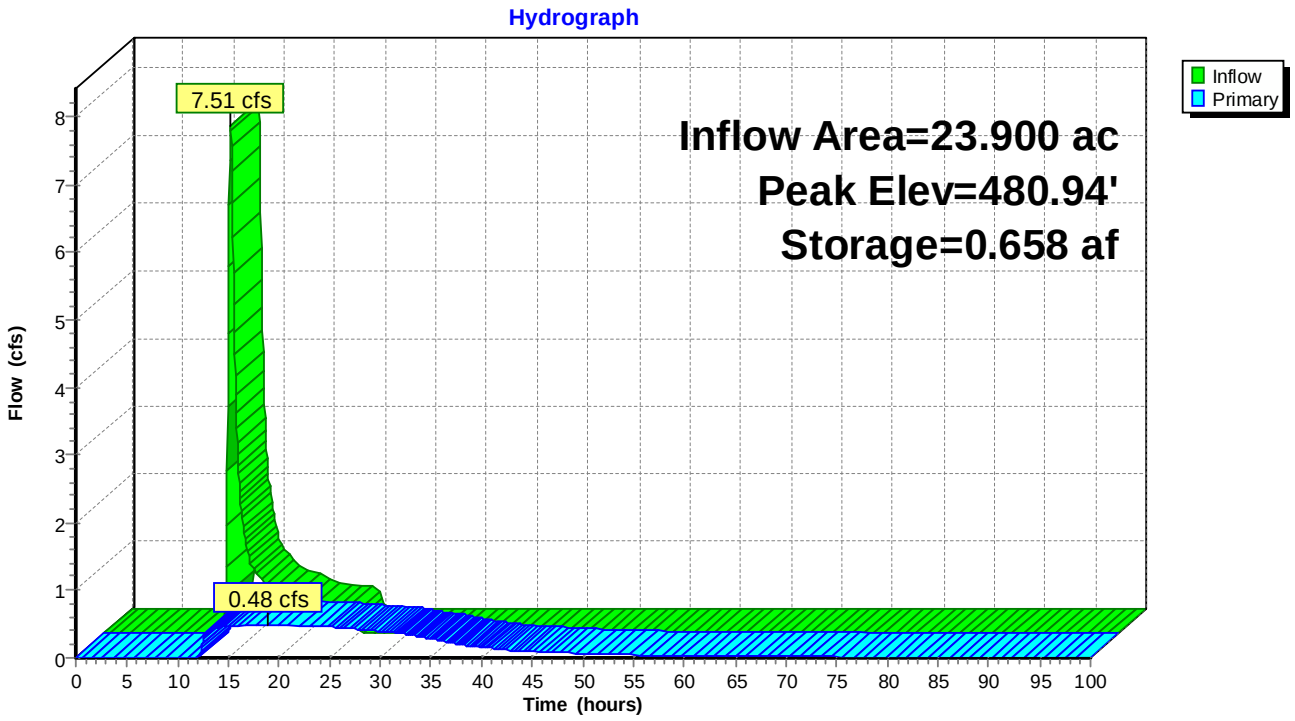
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.400 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

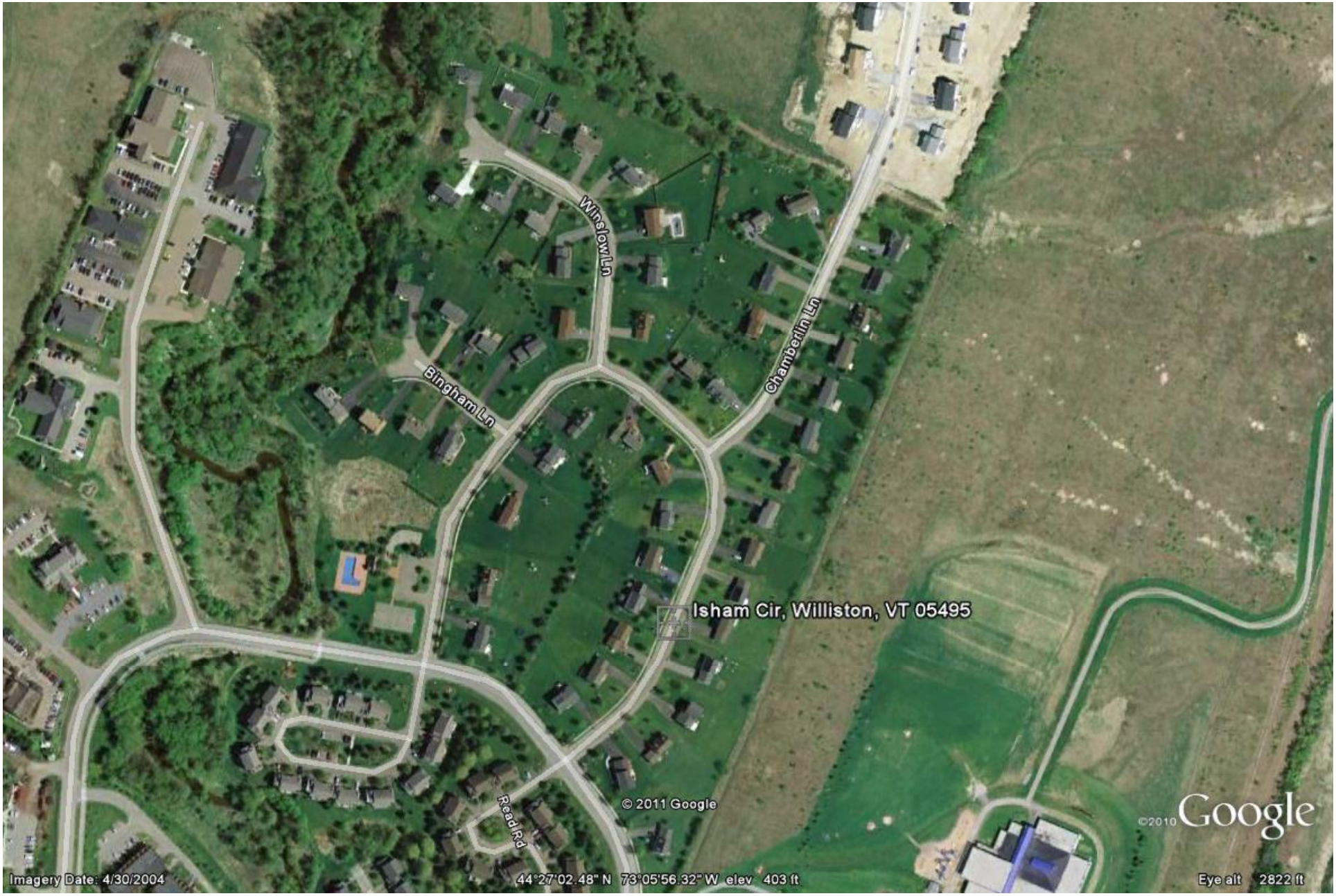
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.700	0.000	0.000
481.00	0.700	0.700	0.700
482.00	0.700	0.700	1.400

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**5.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.48 cfs @ 18.90 hrs HW=480.94' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.48 cfs @ 3.55 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
7.51 cfs
0.48 cfs
Inflow Area=23.900 ac
Peak Elev=480.94'
Storage=0.658 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100



ISHAM CIRCLE: PERMIT 1-1217

Source: USGS
Source: NASA, NGA, USGS
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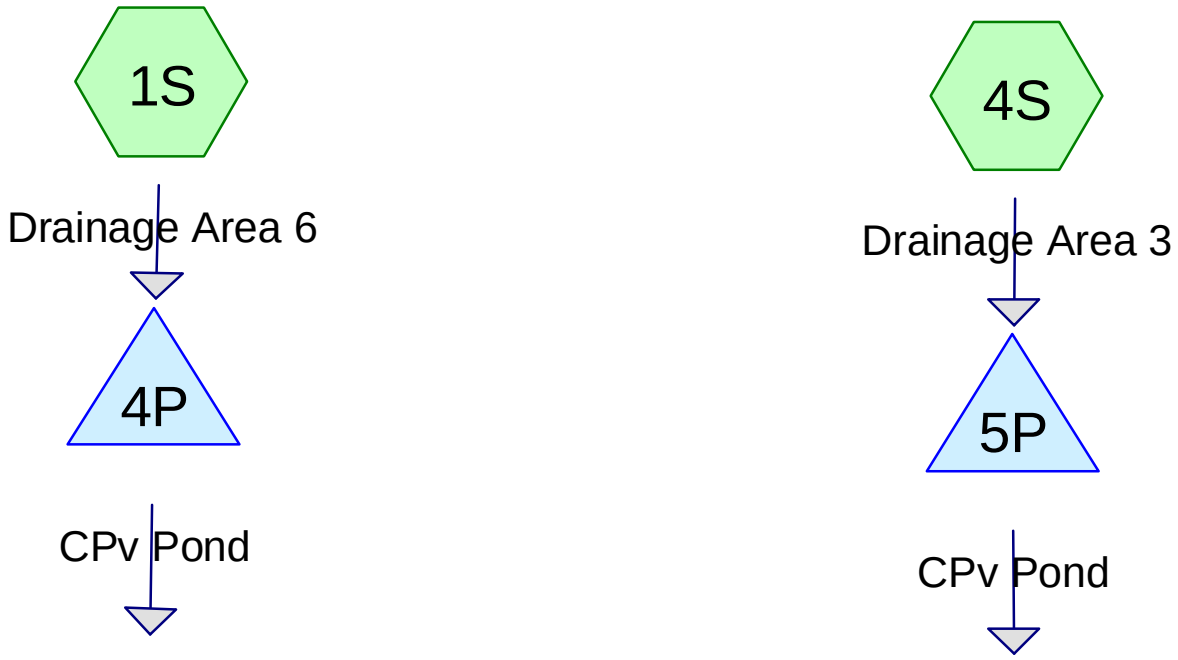

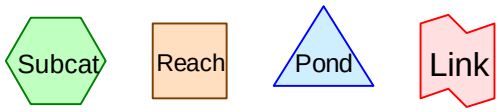

Drainage Diagram for 1-1217-D&K
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Summary for Subcatchment 1S: Drainage Area 6

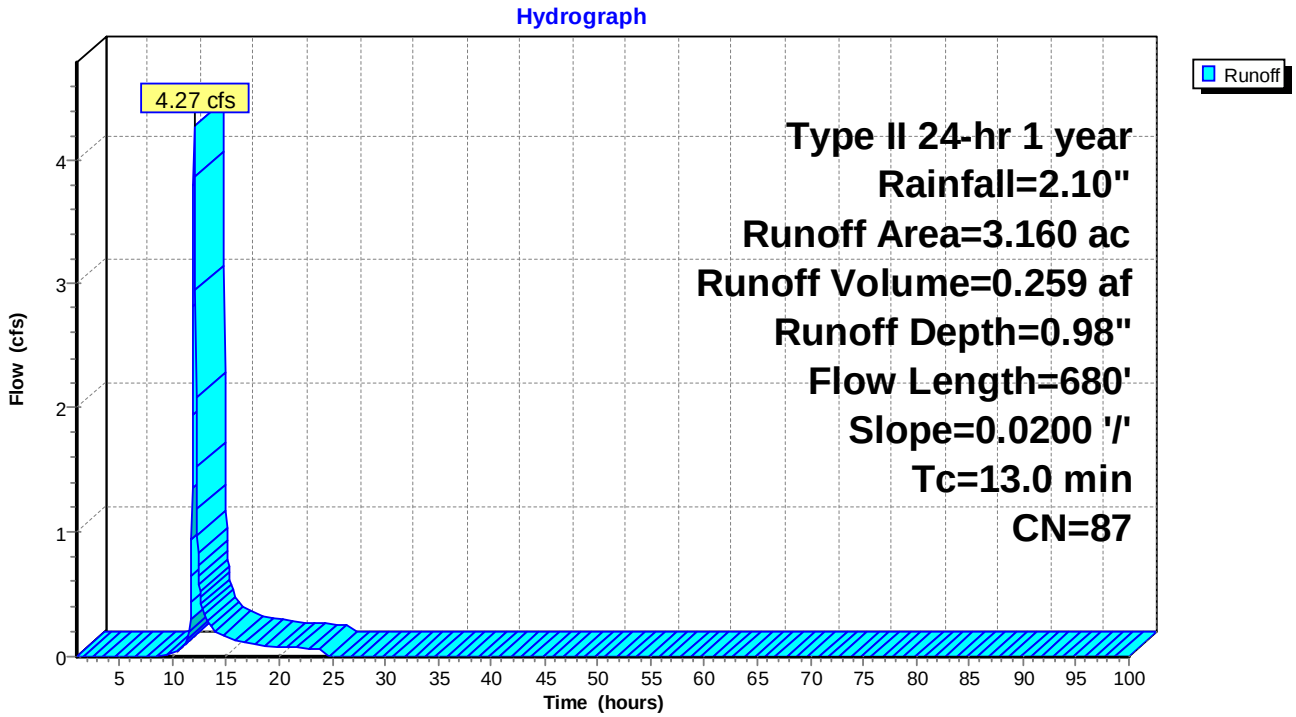
Runoff = 4.27 cfs @ 12.05 hrs, Volume= 0.259 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 1.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	1.150	98	
	2.010	80	>75% Grass cover, Good, HSG D
	3.160	87	Weighted Average
	2.010		63.61% Pervious Area
	1.150		36.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	680	0.0200	0.87		**Lag/CN Method,**

Subcatchment 1S: Drainage Area 6



Summary for Subcatchment 4S: Drainage Area 3

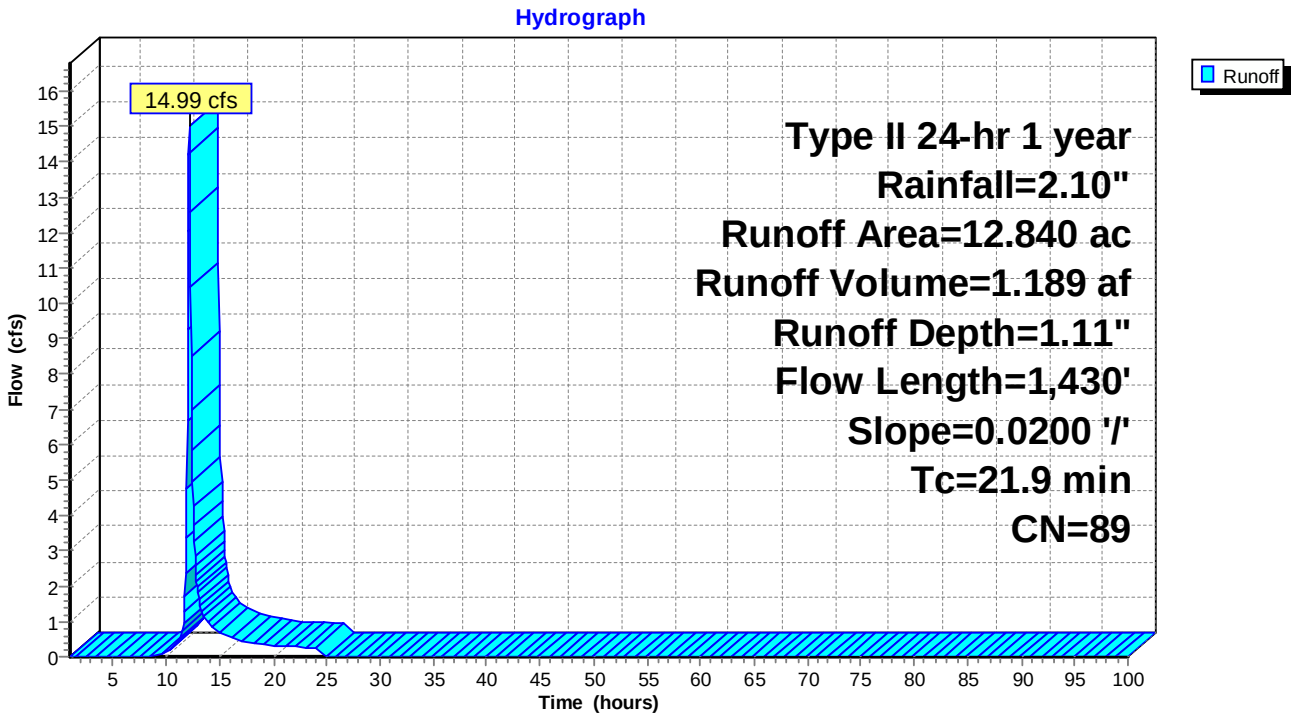
Runoff = 14.99 cfs @ 12.15 hrs, Volume= 1.189 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 1.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	12.840	89	
	12.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,430	0.0200	1.09		**Lag/CN Method,**

Subcatchment 4S: Drainage Area 3



Summary for Pond 4P: CPv Pond

Inflow Area = 3.160 ac, 36.39% Impervious, Inflow Depth = 0.98" for 1 year event
Inflow = 4.27 cfs @ 12.05 hrs, Volume= 0.259 af
Outflow = 0.13 cfs @ 15.92 hrs, Volume= 0.255 af, Atten= 97%, Lag= 231.9 min
Primary = 0.13 cfs @ 15.92 hrs, Volume= 0.255 af

Routing by Stor-Ind method, Time Span= 1.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.91' @ 15.92 hrs Surf.Area= 0.180 ac Storage= 0.165 af

Plug-Flow detention time= 778.2 min calculated for 0.255 af (98% of inflow)
Center-of-Mass det. time= 769.2 min (1,610.5 - 841.3)

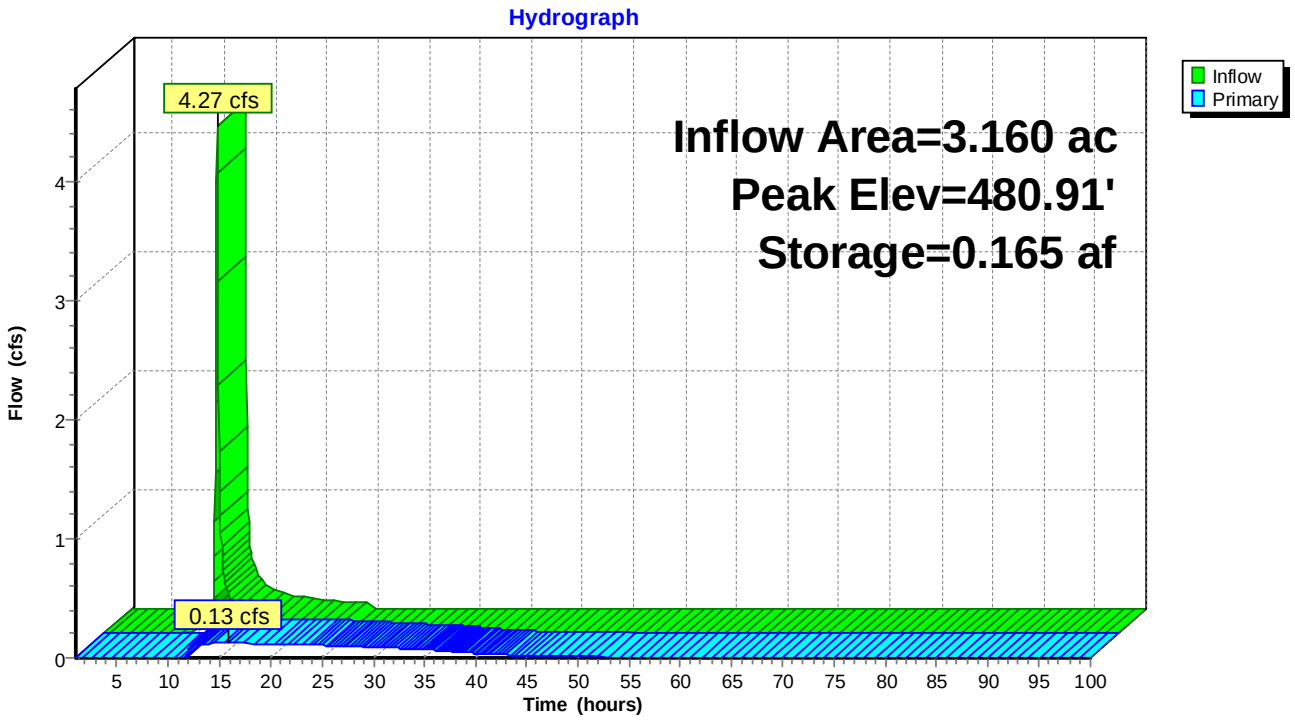
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.360 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.180	0.000	0.000
481.00	0.180	0.180	0.180
482.00	0.180	0.180	0.360

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.75' S= 0.0250 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.13 cfs @ 15.92 hrs HW=480.91' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.13 cfs @ 2.58 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv Pond



Summary for Pond 5P: CPv Pond

Inflow Area =	12.840 ac,	0.00% Impervious,	Inflow Depth =	1.11"	for 1 year event
Inflow =	14.99 cfs @	12.15 hrs,	Volume=	1.189 af	
Outflow =	0.72 cfs @	14.91 hrs,	Volume=	1.156 af,	Atten= 95%, Lag= 165.3 min
Primary =	0.72 cfs @	14.91 hrs,	Volume=	1.156 af	

Routing by Stor-Ind method, Time Span= 1.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.92' @ 14.91 hrs Surf.Area= 0.800 ac Storage= 0.733 af

Plug-Flow detention time= 705.4 min calculated for 1.156 af (97% of inflow)
Center-of-Mass det. time= 688.9 min (1,529.6 - 840.6)

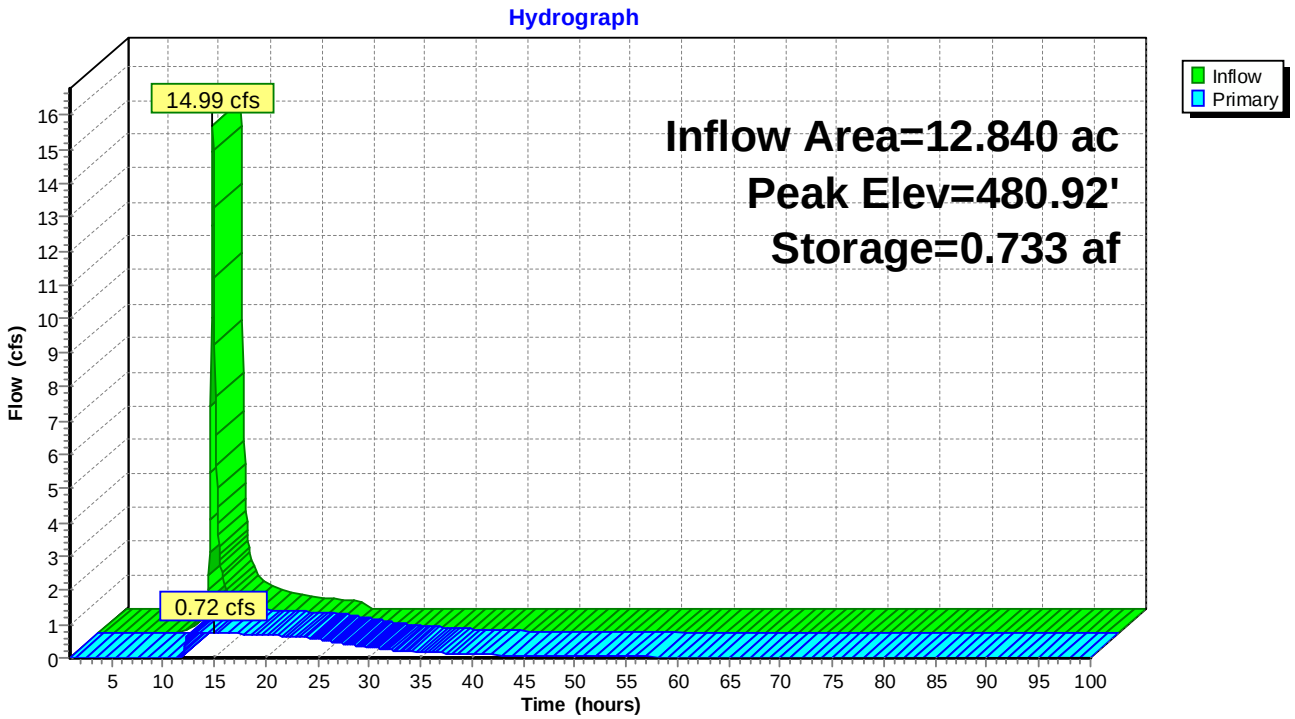
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.600 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.800	0.000	0.000
481.00	0.800	0.800	0.800
482.00	0.800	0.800	1.600

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**6.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.72 cfs @ 14.91 hrs HW=480.92' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.72 cfs @ 3.65 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



HERITAGE MEADOWS: PERMIT 1-1258

Source: USGS
Source: NASA, NGA, USGS
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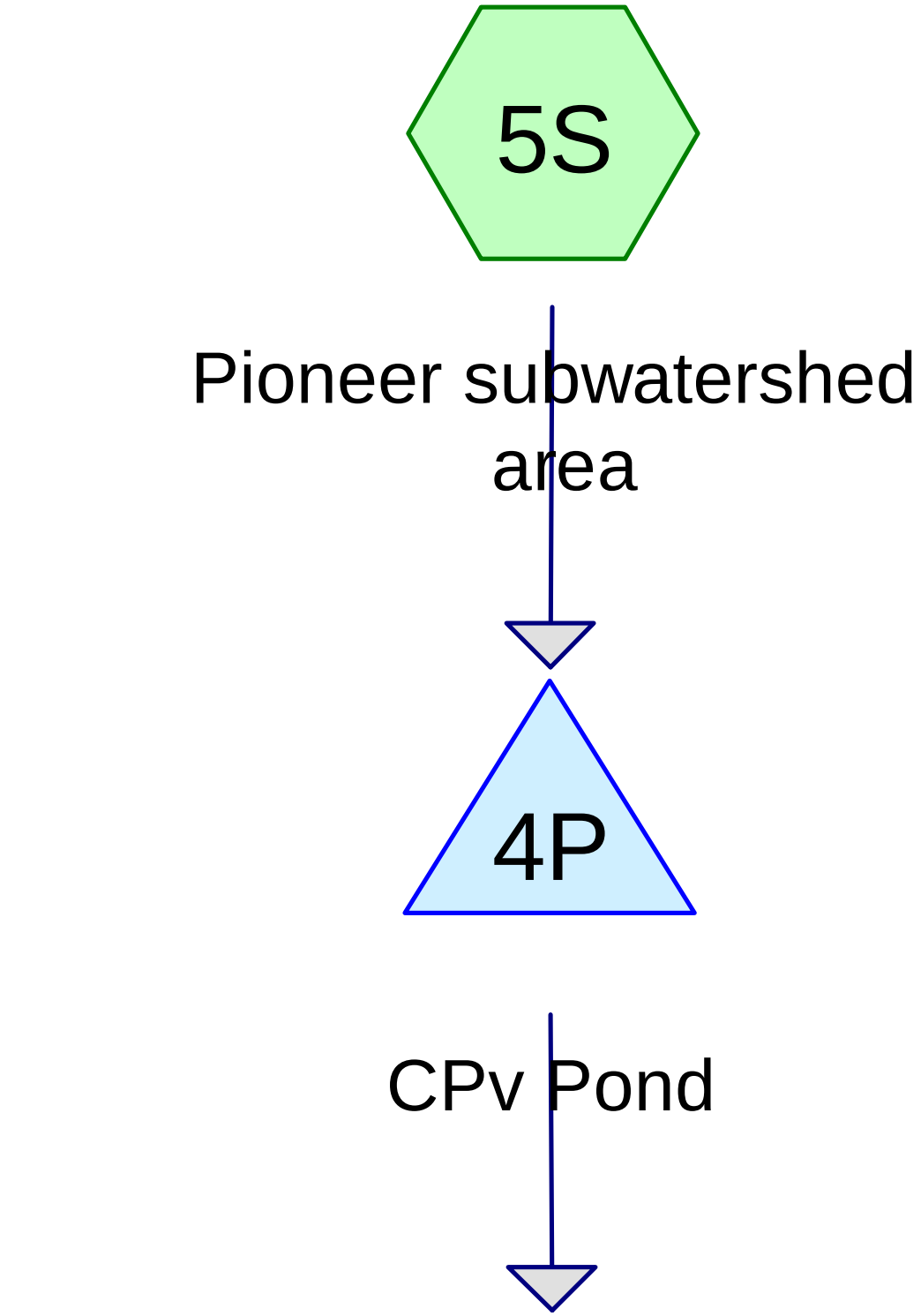

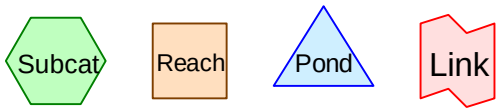

Drainage Diagram for 1-1258-D&K
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Summary for Subcatchment 5S: Pioneer subwatershed area

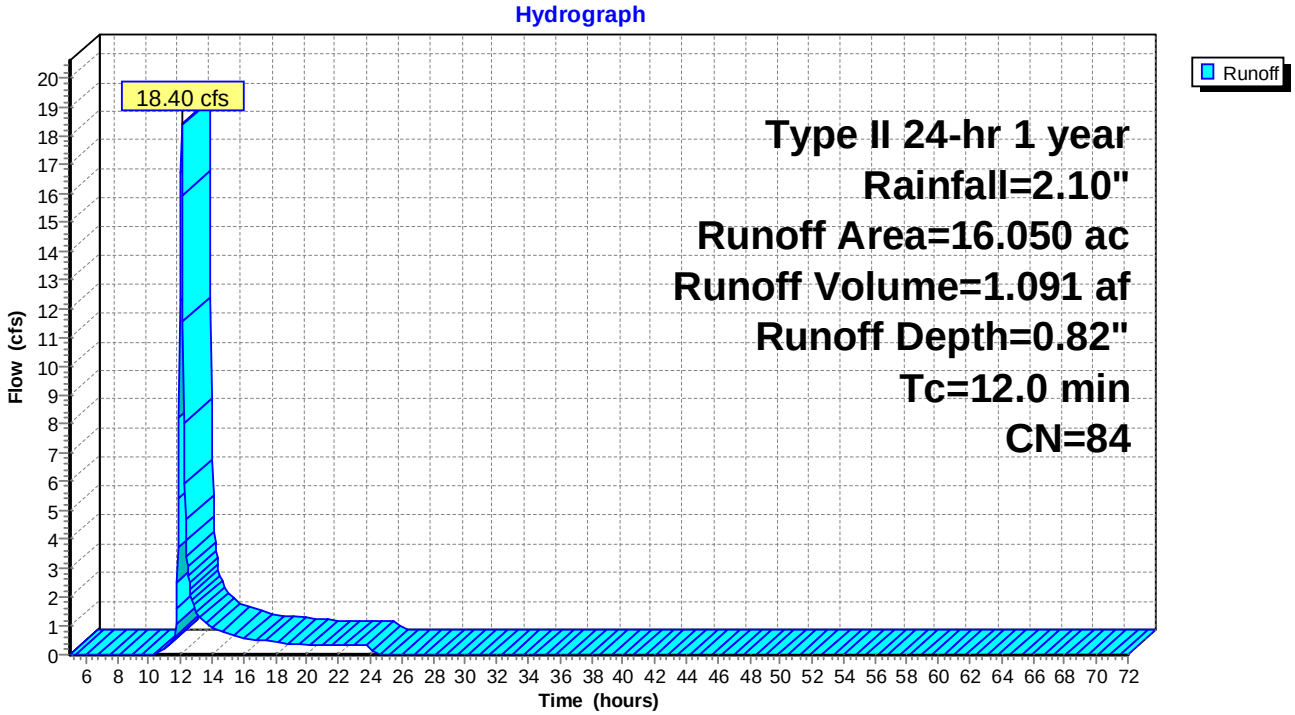
Runoff = 18.40 cfs @ 12.05 hrs, Volume= 1.091 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	5.050	98	
*	11.000	78	
	16.050	84	Weighted Average
	11.000		68.54% Pervious Area
	5.050		31.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 5S: Pioneer subwatershed area



Summary for Pond 4P: CPv Pond

Inflow Area = 16.050 ac, 31.46% Impervious, Inflow Depth = 0.82" for 1 year event
Inflow = 18.40 cfs @ 12.05 hrs, Volume= 1.091 af
Outflow = 0.48 cfs @ 17.16 hrs, Volume= 1.033 af, Atten= 97%, Lag= 307.0 min
Primary = 0.48 cfs @ 17.16 hrs, Volume= 1.033 af

Routing by Stor-Ind method, Time Span= 5.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 480.93' @ 17.16 hrs Surf.Area= 0.750 ac Storage= 0.697 af

Plug-Flow detention time= 833.0 min calculated for 1.033 af (95% of inflow)
Center-of-Mass det. time= 804.1 min (1,657.0 - 853.0)

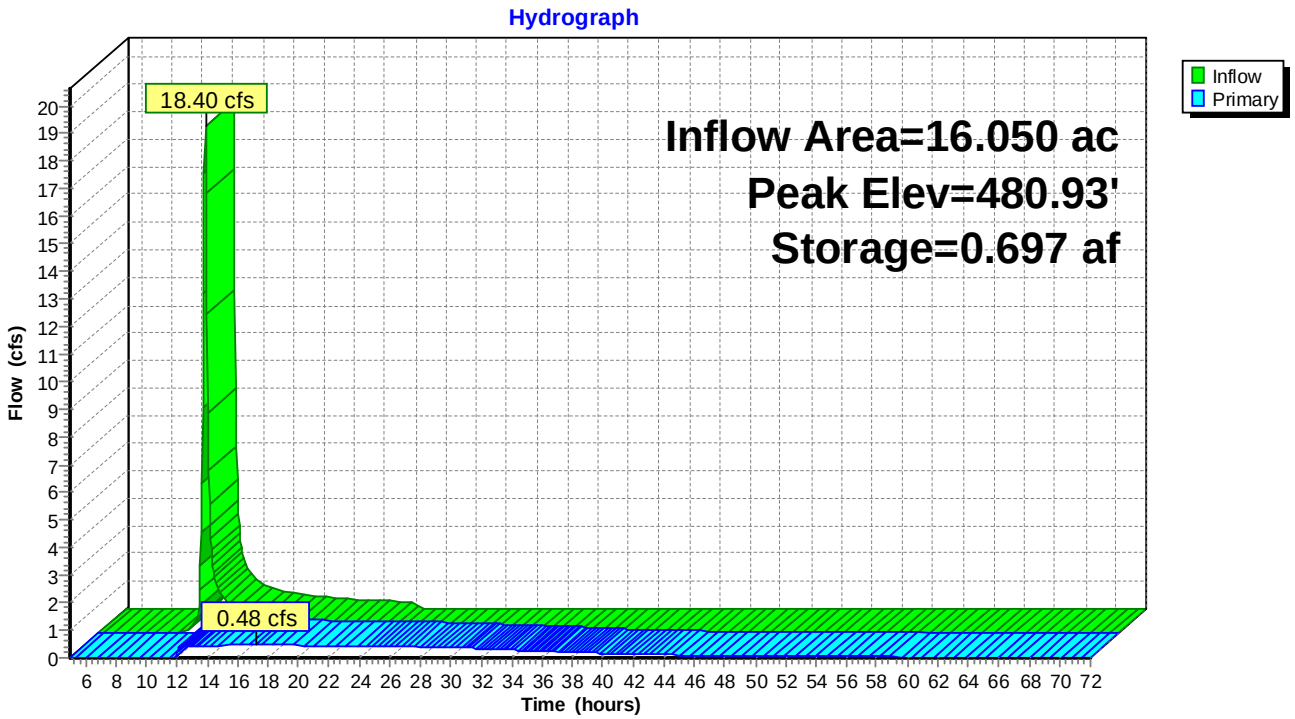
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.500 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.750	0.000	0.000
481.00	0.750	0.750	0.750
482.00	0.750	0.750	1.500

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**5.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.48 cfs @ 17.16 hrs HW=480.93' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.48 cfs @ 3.53 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv Pond



BRENNEN WOODS: PERMIT 1-1272 S/N 2

115m
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Source: USGS
Source: NASA, NGA, USGS
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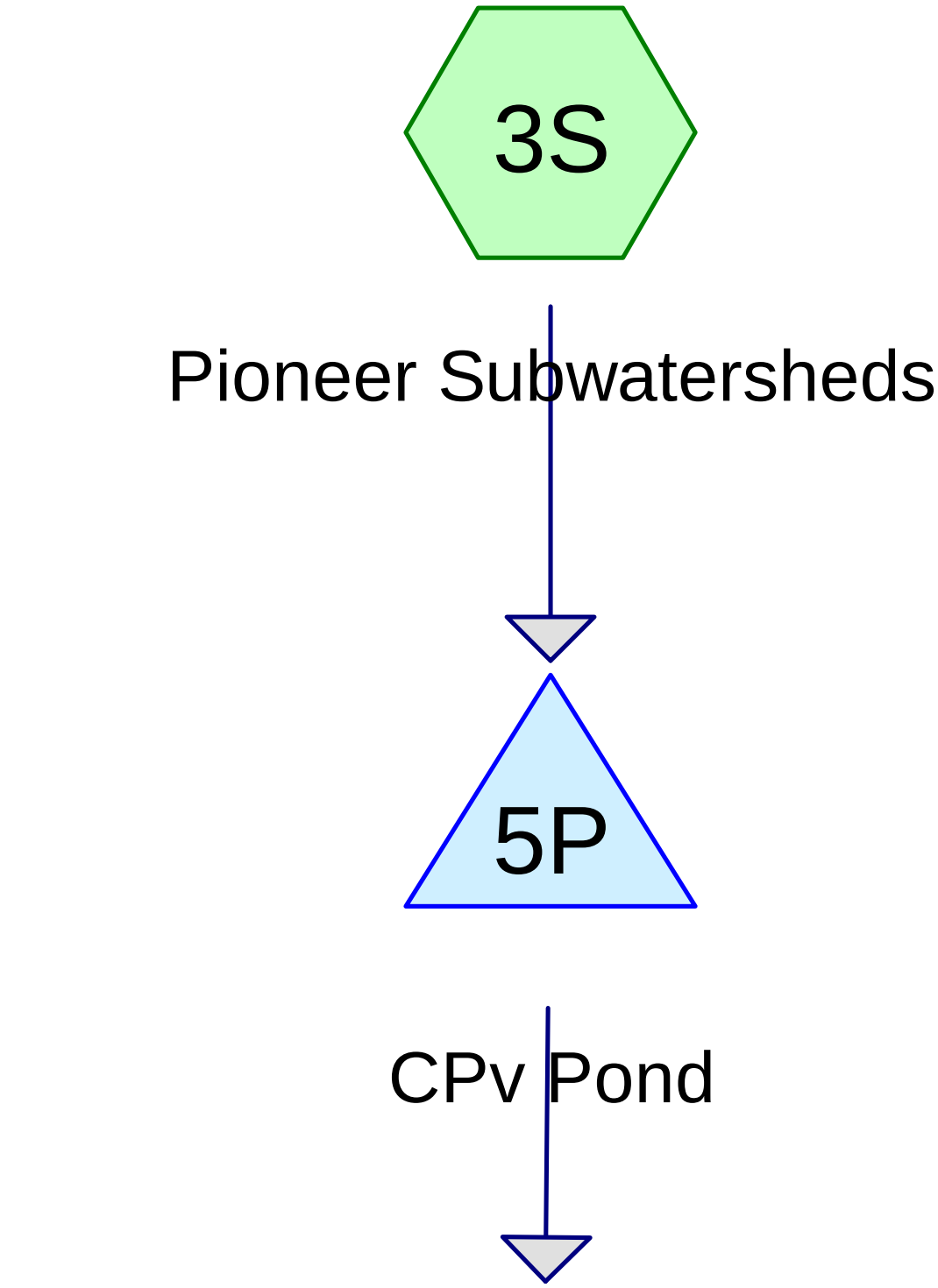

Subcat Reach Pond Link

Drainage Diagram for 1-1272 - D&K
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Summary for Subcatchment 3S: Pioneer Subwatersheds

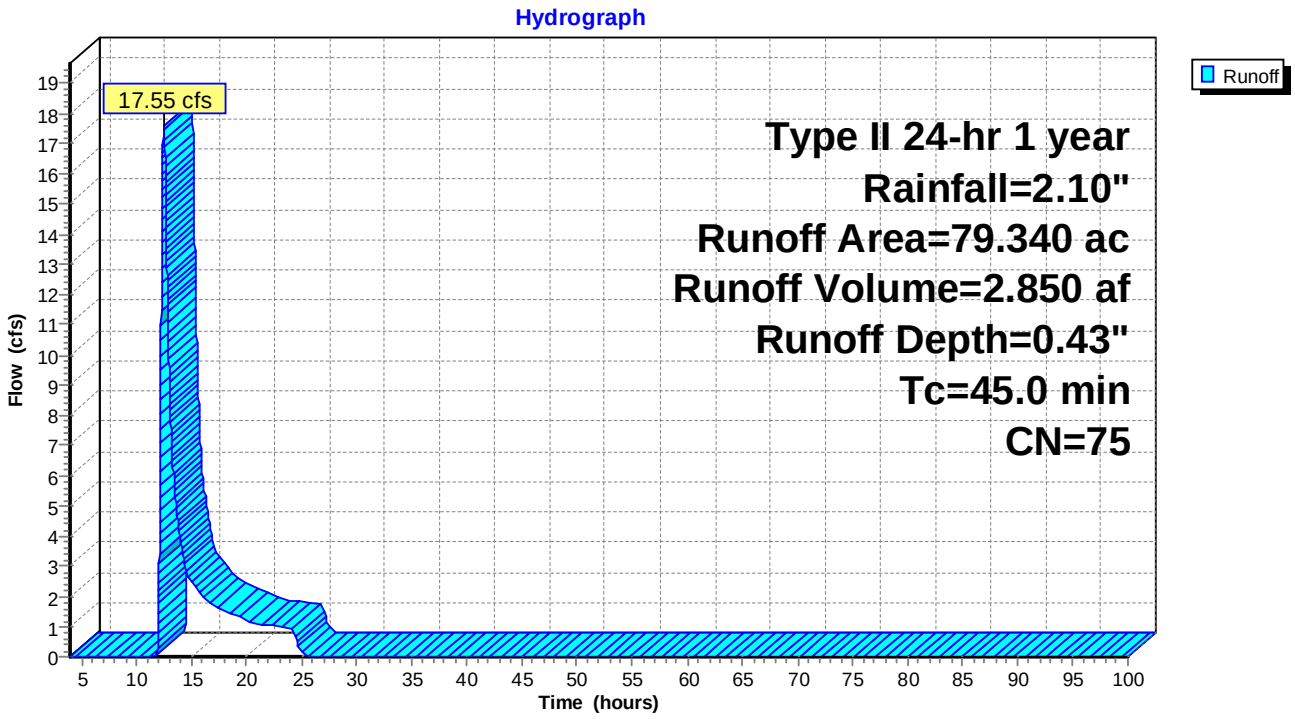
Runoff = 17.55 cfs @ 12.50 hrs, Volume= 2.850 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 4.00-100.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	79.340	75	
	79.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.0					**Direct Entry,**

Subcatchment 3S: Pioneer Subwatersheds



Summary for Pond 5P: CPv Pond

Inflow Area = 79.340 ac, 0.00% Impervious, Inflow Depth = 0.43" for 1 year event
Inflow = 17.55 cfs @ 12.50 hrs, Volume= 2.850 af
Outflow = 1.64 cfs @ 17.46 hrs, Volume= 2.744 af, Atten= 91%, Lag= 297.5 min
Primary = 1.64 cfs @ 17.46 hrs, Volume= 2.744 af

Routing by Stor-Ind method, Time Span= 4.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 480.97' @ 17.46 hrs Surf.Area= 1.600 ac Storage= 1.556 af

Plug-Flow detention time= 723.1 min calculated for 2.744 af (96% of inflow)
Center-of-Mass det. time= 703.5 min (1,626.9 - 923.3)

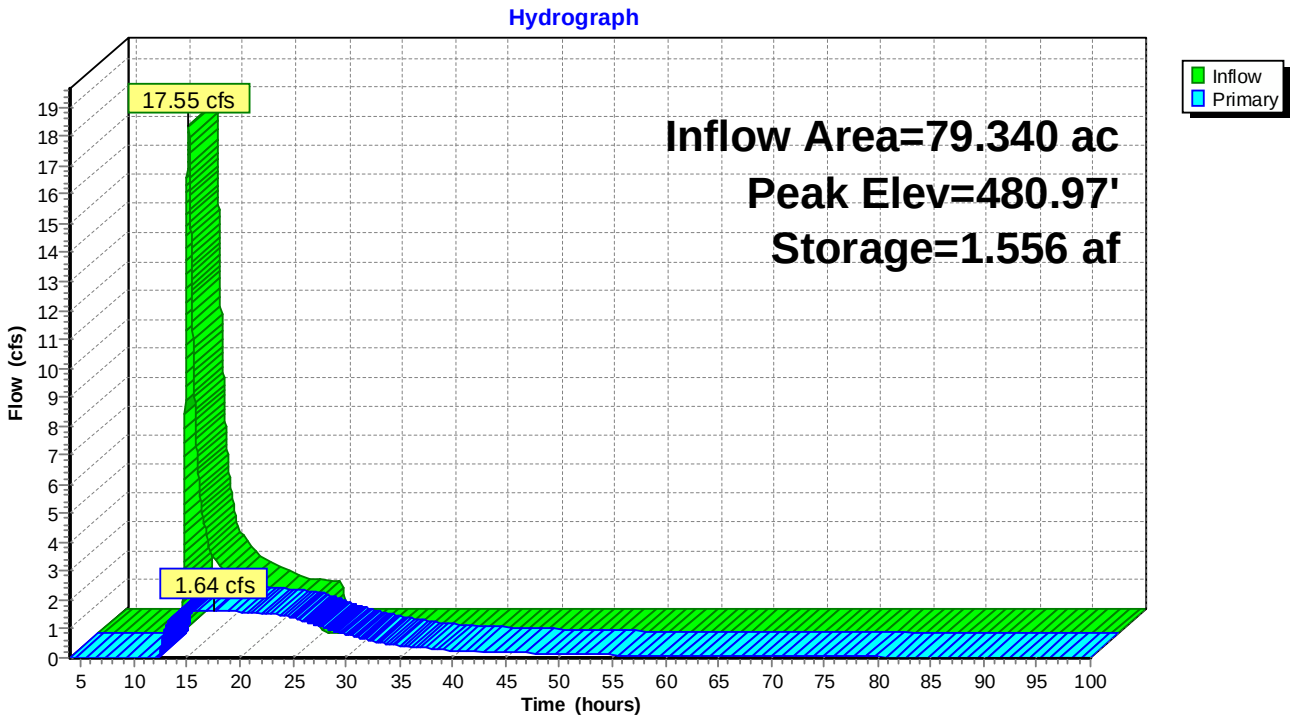
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	3.200 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	1.600	0.000	0.000
481.00	1.600	1.600	1.600
482.00	1.600	1.600	3.200

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**9.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.64 cfs @ 17.46 hrs HW=480.97' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.64 cfs @ 3.72 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



COYOTE RUN: PERMIT 1-1507

Source: USGS
Source: NASA, NGA, USGS
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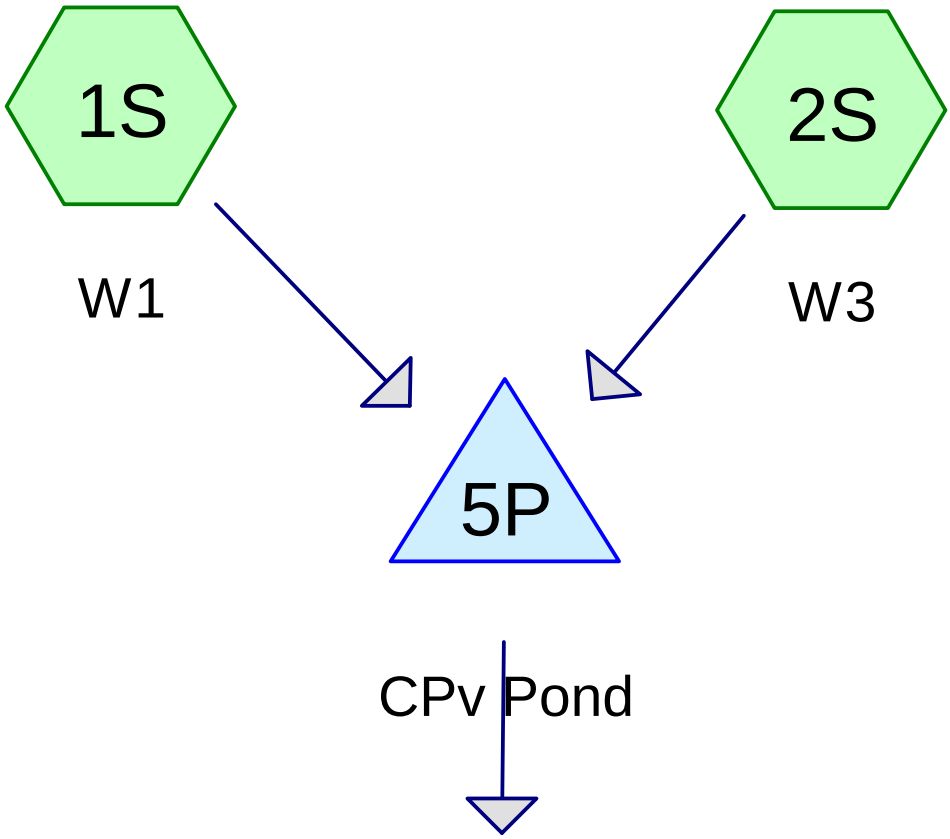

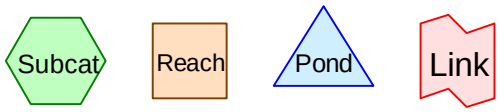

Drainage Diagram for 1-1507_East - D&K
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Summary for Subcatchment 1S: W1

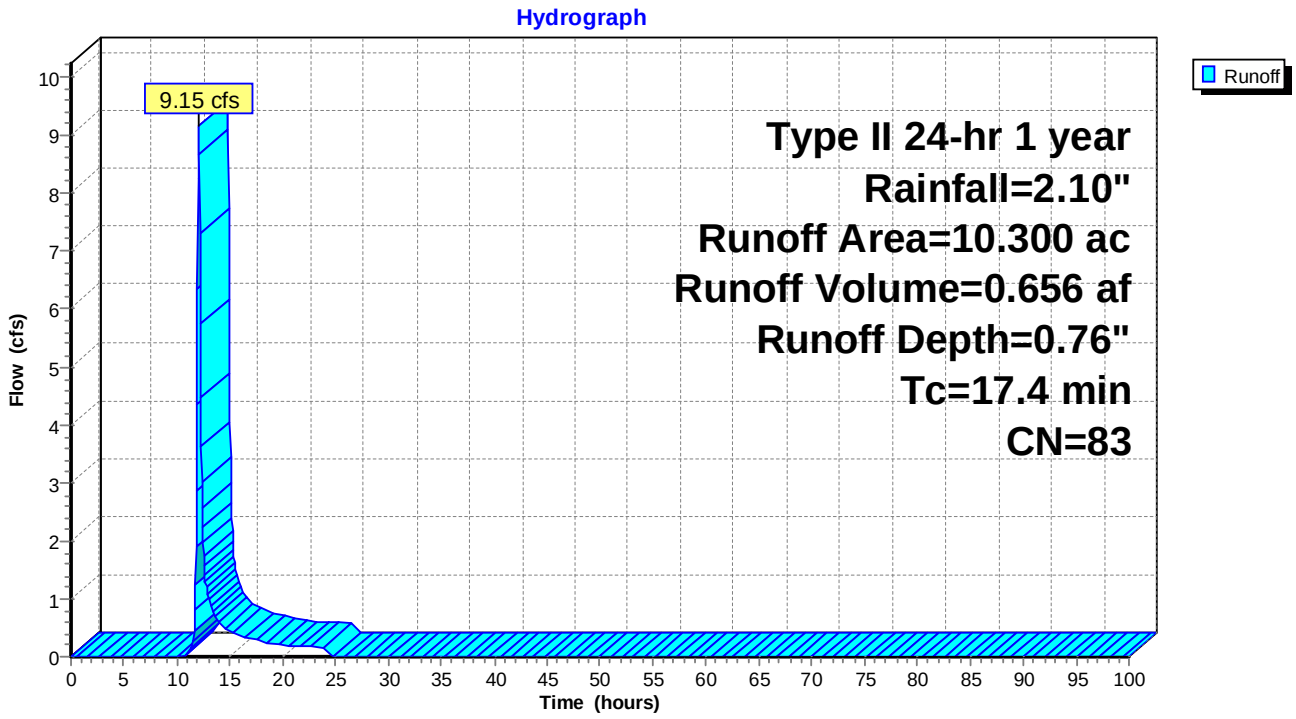
Runoff = 9.15 cfs @ 12.11 hrs, Volume= 0.656 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	10.300	83	
	10.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4					**Direct Entry,**

Subcatchment 1S: W1



Summary for Subcatchment 2S: W3

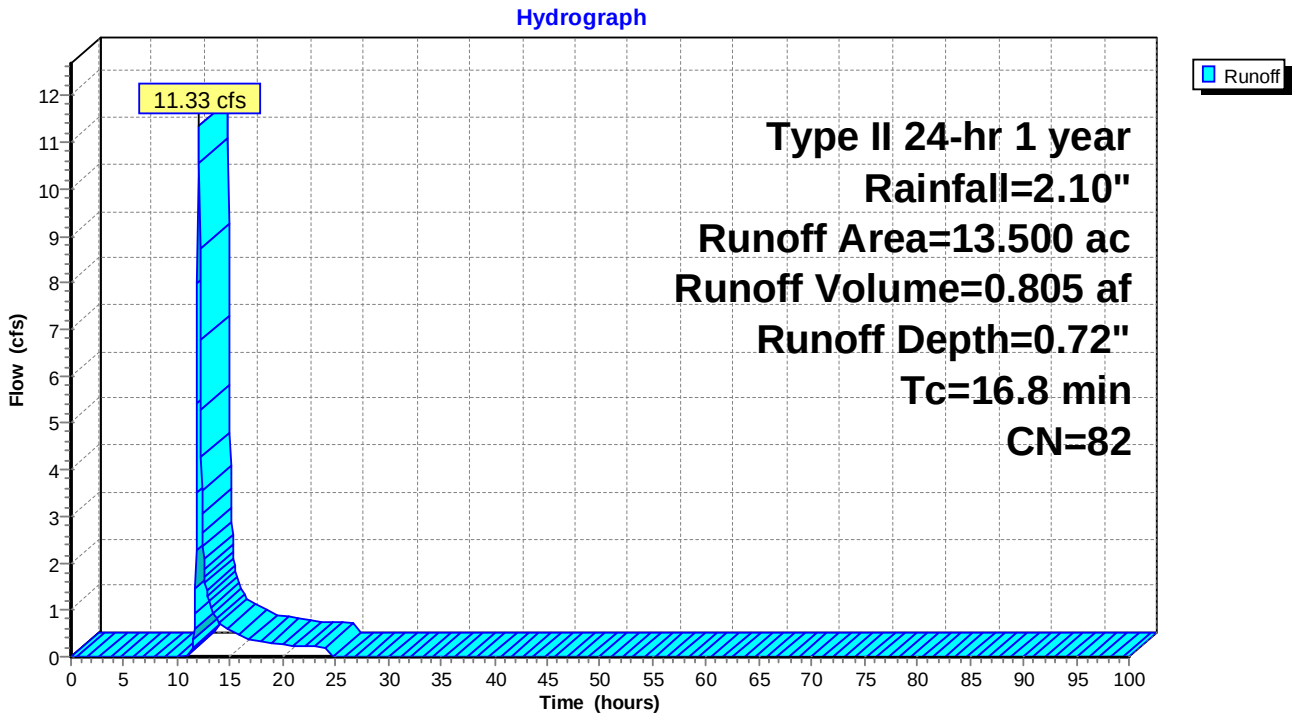
Runoff = 11.33 cfs @ 12.10 hrs, Volume= 0.805 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	13.500	82	
	13.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8					**Direct Entry,**

Subcatchment 2S: W3



Summary for Pond 5P: CPv Pond

Inflow Area = 23.800 ac, 0.00% Impervious, Inflow Depth = 0.74" for 1 year event
Inflow = 20.47 cfs @ 12.10 hrs, Volume= 1.461 af
Outflow = 0.71 cfs @ 16.72 hrs, Volume= 1.408 af, Atten= 97%, Lag= 277.1 min
Primary = 0.71 cfs @ 16.72 hrs, Volume= 1.408 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.90' @ 16.72 hrs Surf.Area= 1.000 ac Storage= 0.898 af

Plug-Flow detention time= 837.8 min calculated for 1.407 af (96% of inflow)
Center-of-Mass det. time= 819.2 min (1,683.2 - 864.1)

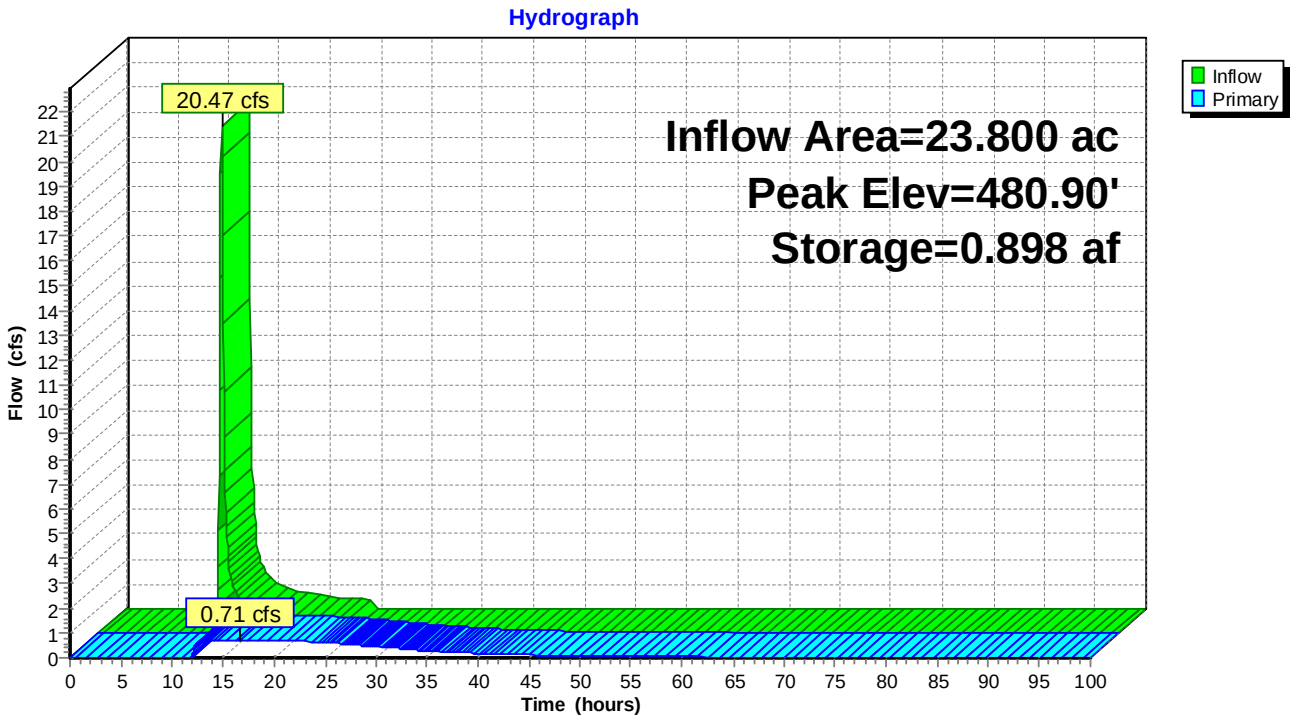
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	2.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

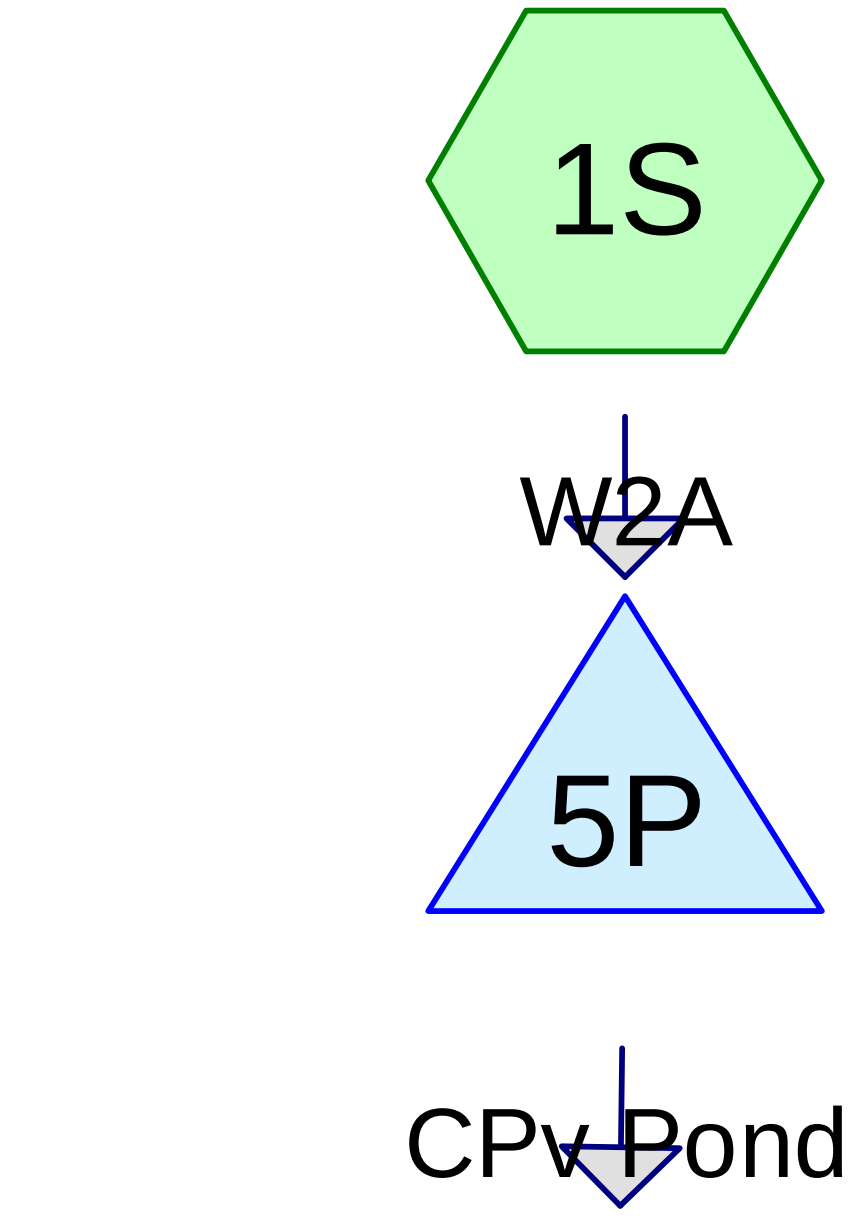
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	1.000	0.000	0.000
481.00	1.000	1.000	1.000
482.00	1.000	1.000	2.000

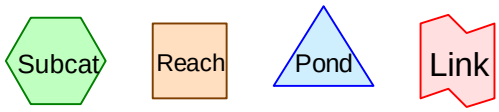
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**6.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.71 cfs @ 16.72 hrs HW=480.90' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.71 cfs @ 3.62 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond







Drainage Diagram for 1-1507_West - D&K
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Summary for Subcatchment 1S: W2A

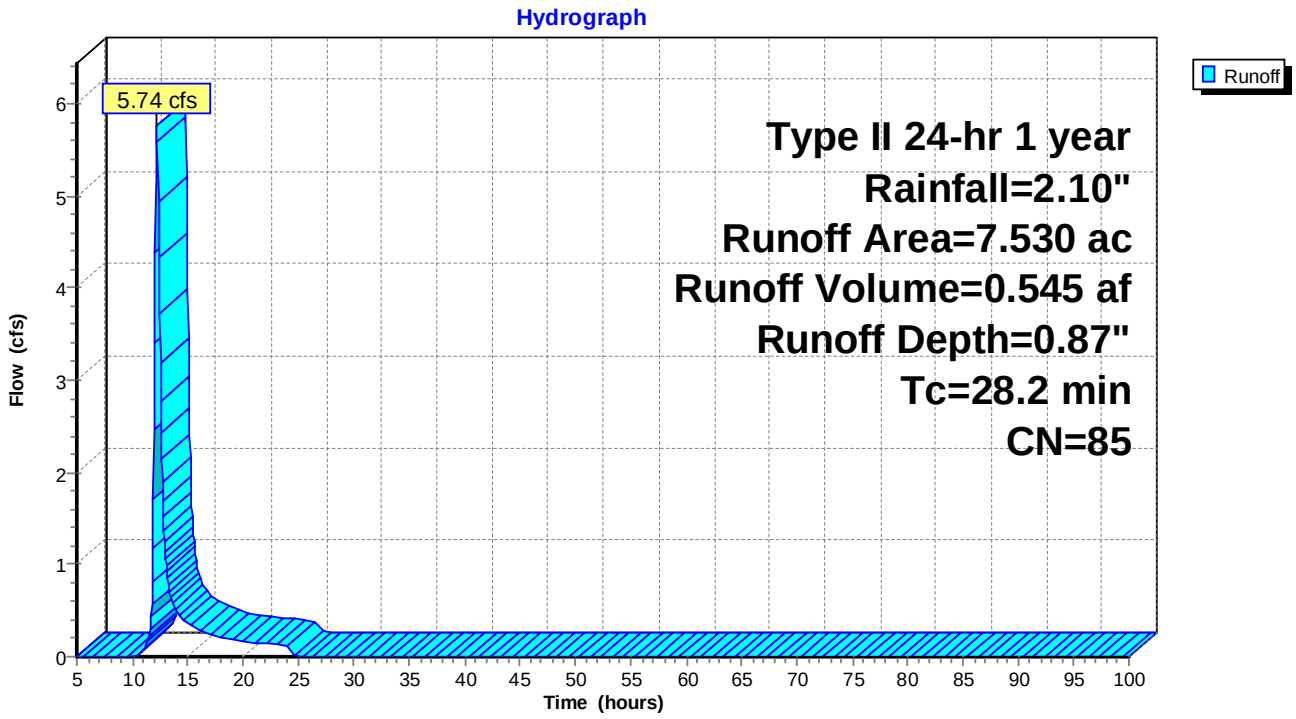
Runoff = 5.74 cfs @ 12.23 hrs, Volume= 0.545 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	7.530	85	
	7.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2					**Direct Entry,**

Subcatchment 1S: W2A



Summary for Pond 5P: CPv Pond

Inflow Area =	7.530 ac,	0.00% Impervious,	Inflow Depth =	0.87"	for 1 year event
Inflow =	5.74 cfs @	12.23 hrs,	Volume=	0.545 af	
Outflow =	0.26 cfs @	16.52 hrs,	Volume=	0.533 af,	Atten= 95%, Lag= 257.0 min
Primary =	0.26 cfs @	16.52 hrs,	Volume=	0.533 af	

Routing by Stor-Ind method, Time Span= 5.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.98' @ 16.52 hrs Surf.Area= 0.350 ac Storage= 0.343 af

Plug-Flow detention time= 813.5 min calculated for 0.533 af (98% of inflow)
Center-of-Mass det. time= 802.4 min (1,666.2 - 863.9)

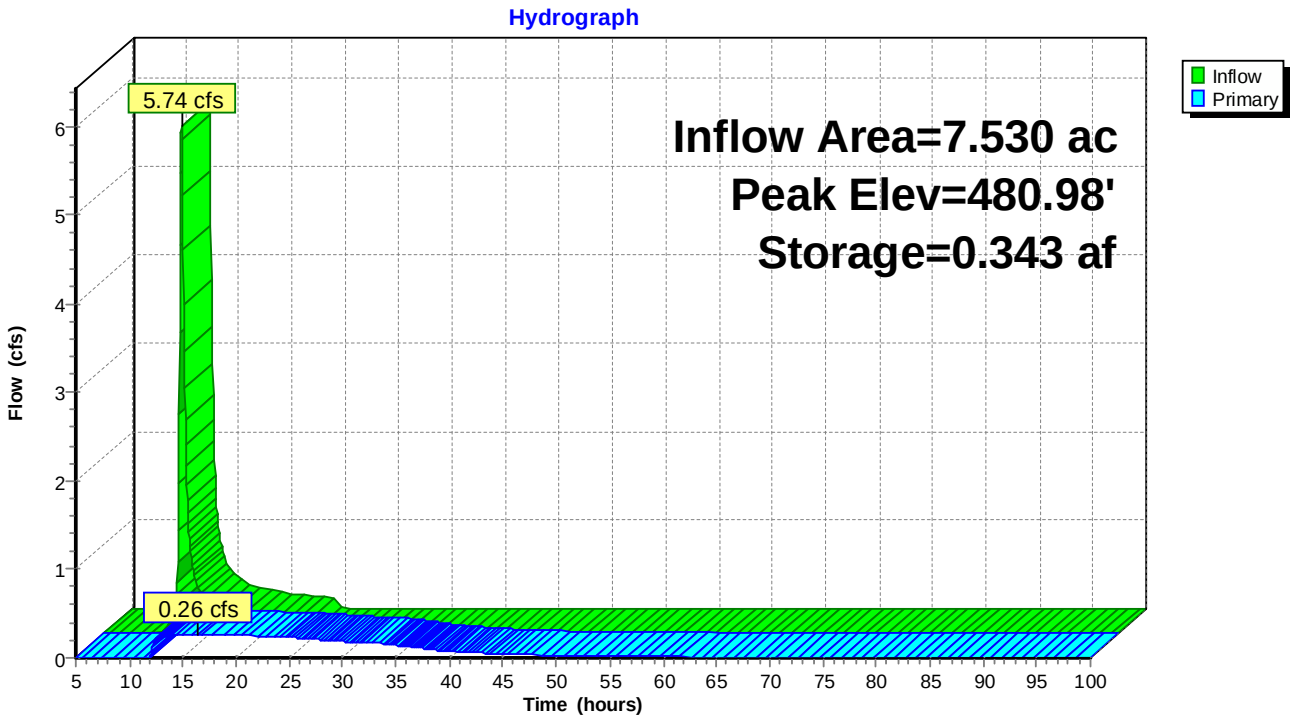
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.700 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.350	0.000	0.000
481.00	0.350	0.350	0.350
482.00	0.350	0.350	0.700

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.75' S= 0.0250 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.26 cfs @ 16.52 hrs HW=480.98' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.26 cfs @ 2.98 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



PLEASANT ACRES: PERMIT 2-0231

Source: USGS
Source: NASA, NGA, USGS
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48 m
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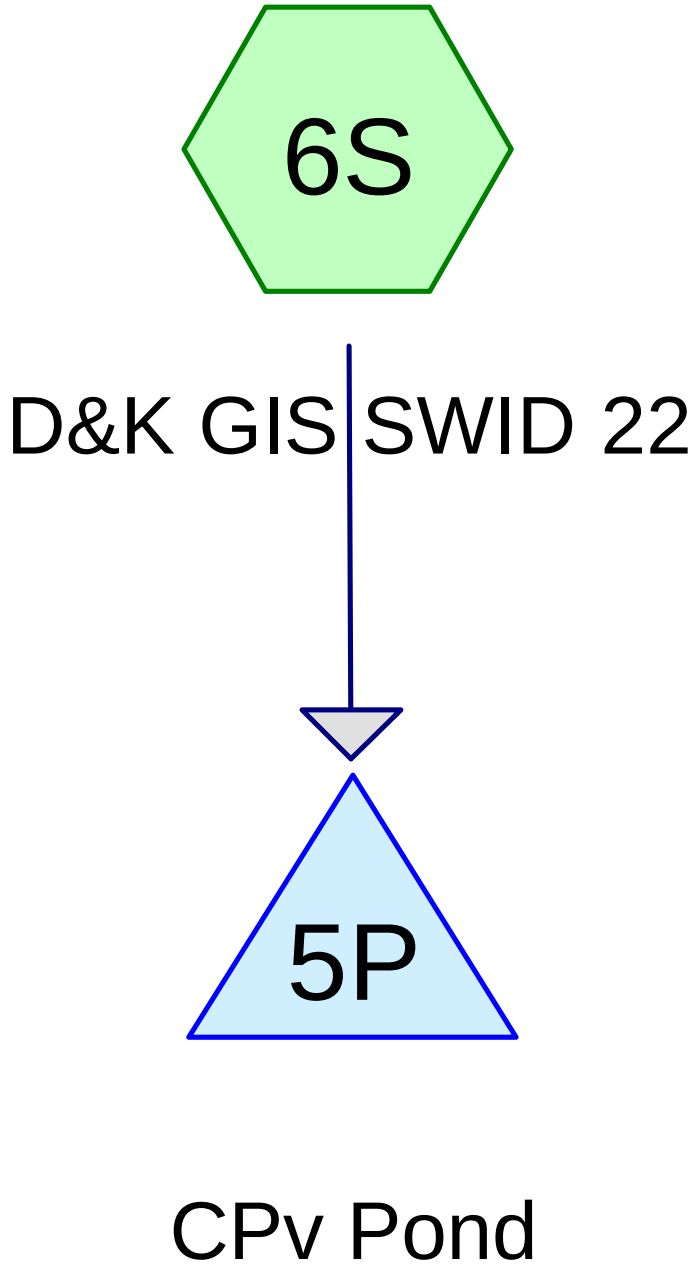

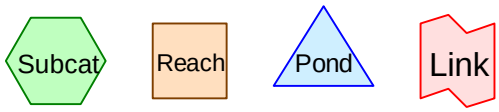

Drainage Diagram for 2-0231- D&K
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Summary for Subcatchment 6S: D&K GIS SWID 22

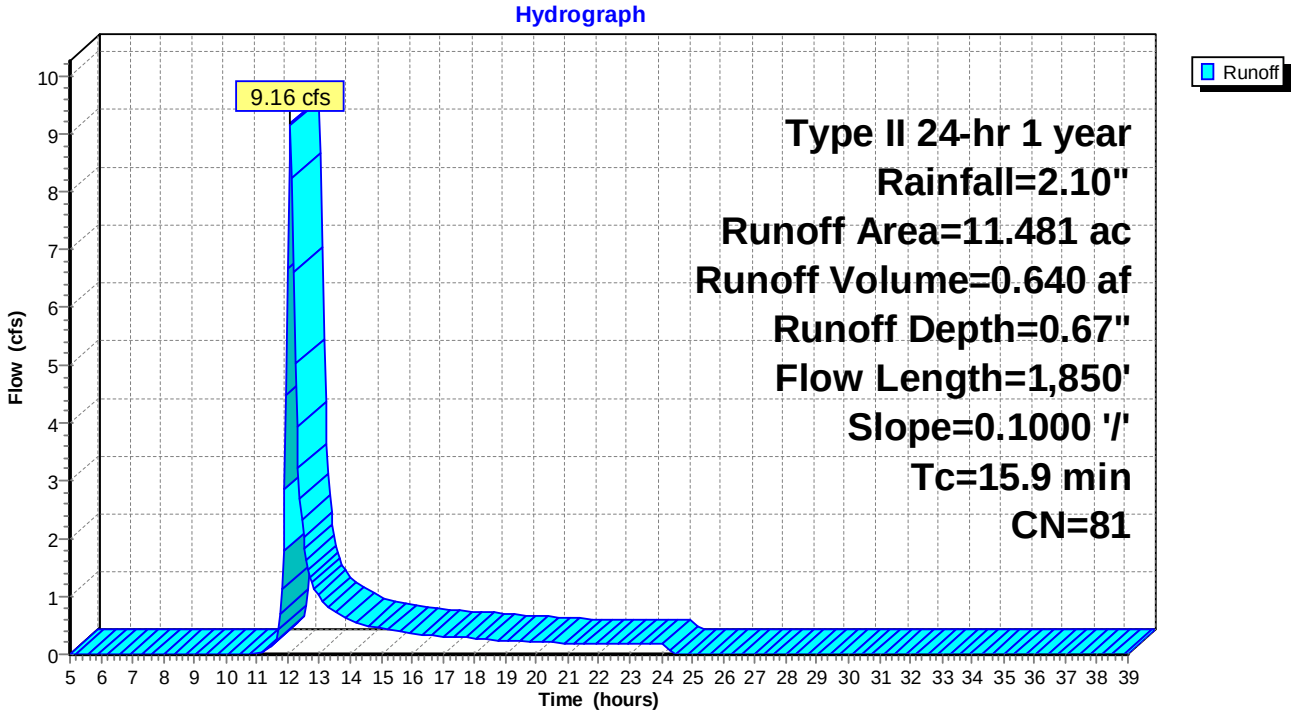
Runoff = 9.16 cfs @ 12.09 hrs, Volume= 0.640 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
11.481	81	1/3 acre lots, 30% imp, HSG C
8.037		70.00% Pervious Area
3.444		30.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	1,850	0.1000	1.94		**Lag/CN Method,**

Subcatchment 6S: D&K GIS SWID 22



Summary for Pond 5P: CPv Pond

Inflow Area = 11.481 ac, 30.00% Impervious, Inflow Depth = 0.67" for 1 year event
Inflow = 9.16 cfs @ 12.09 hrs, Volume= 0.640 af
Outflow = 0.01 cfs @ 24.51 hrs, Volume= 0.014 af, Atten= 100%, Lag= 744.7 min
Primary = 0.01 cfs @ 24.51 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Peak Elev= 480.91' @ 24.51 hrs Surf.Area= 0.700 ac Storage= 0.634 af

Plug-Flow detention time= 866.5 min calculated for 0.014 af (2% of inflow)
Center-of-Mass det. time= 697.7 min (1,566.7 - 869.0)

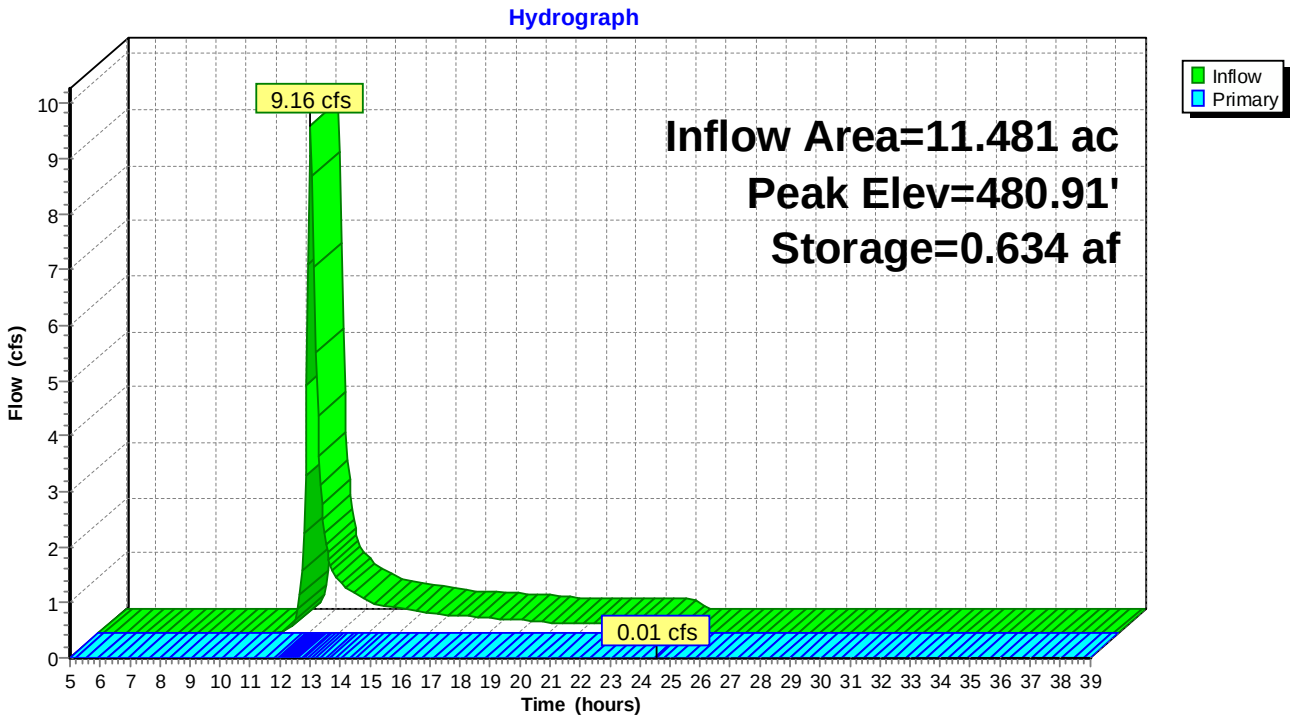
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.400 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.700	0.000	0.000
481.00	0.700	0.700	0.700
482.00	0.700	0.700	1.400

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**1.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.01 cfs @ 24.51 hrs HW=480.91' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.01 cfs @ 1.26 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



ALLENBROOK MEADOWS: PERMIT 2-0954

Source: USGS
Source: NASA, NGA, USGS
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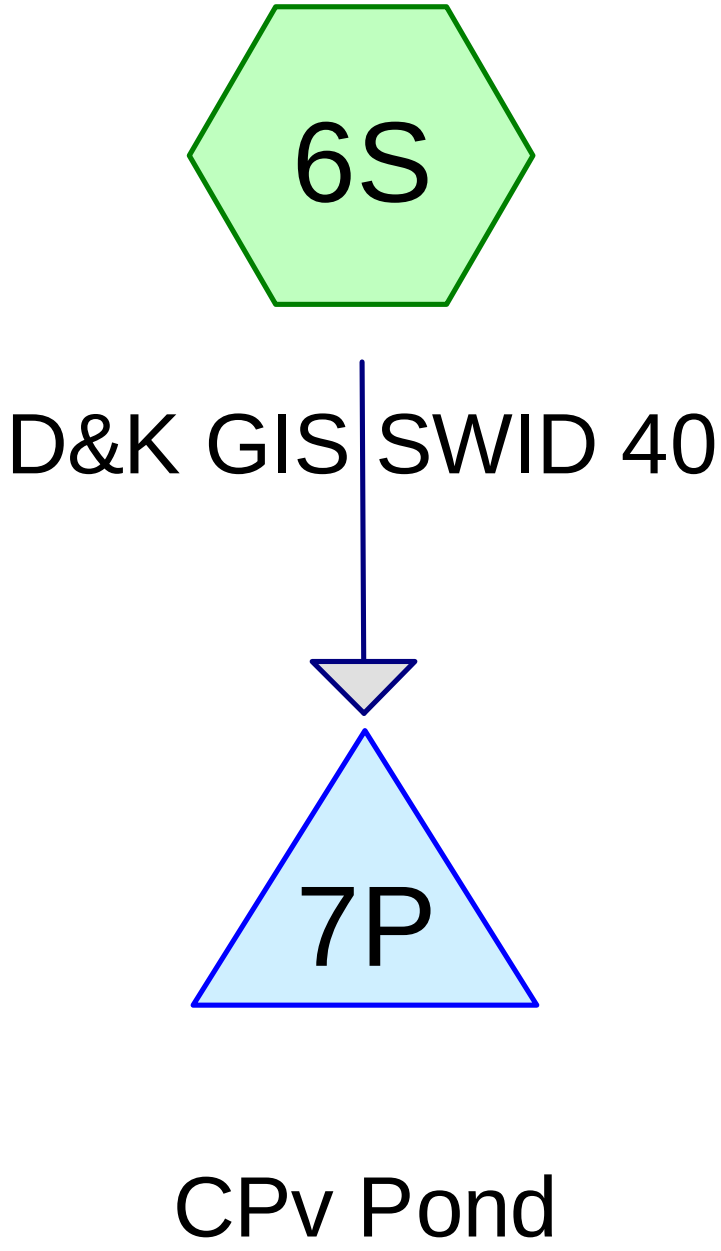

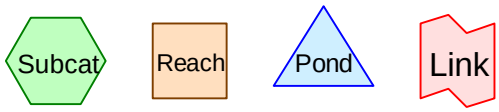

Drainage Diagram for 2-0954- D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
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Summary for Subcatchment 6S: D&K GIS SWID 40

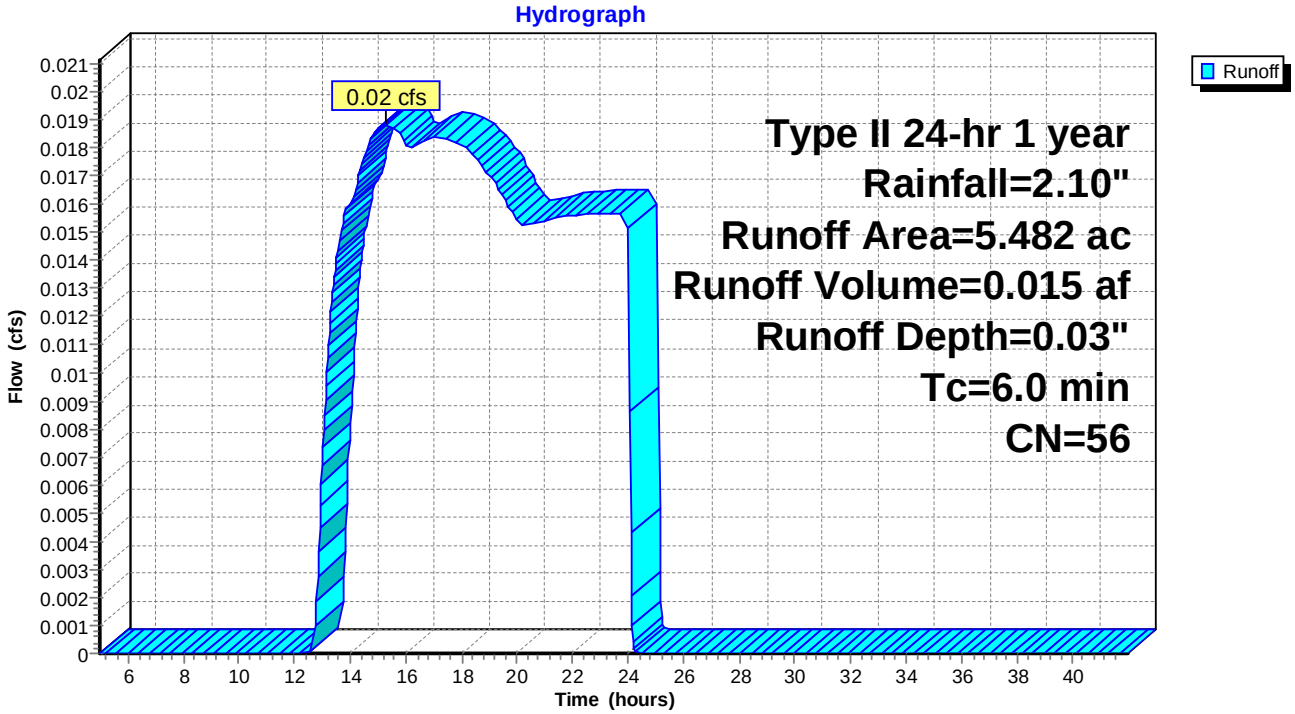
Runoff = 0.02 cfs @ 15.29 hrs, Volume= 0.015 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-41.99 hrs, dt= 0.03 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.170	98	Tennis Court
	1.530	39	>75% Grass cover, Good, HSG A
	3.782	61	1/4 acre lots, 38% imp, HSG A
	5.482	56	Weighted Average
	3.875		70.68% Pervious Area
	1.607		29.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Permit Tc**

Subcatchment 6S: D&K GIS SWID 40



Summary for Pond 7P: CPv Pond

Inflow Area = 5.482 ac, 29.32% Impervious, Inflow Depth = 0.03" for 1 year event
Inflow = 0.02 cfs @ 15.29 hrs, Volume= 0.015 af
Outflow = 0.01 cfs @ 24.09 hrs, Volume= 0.012 af, Atten= 62%, Lag= 528.0 min
Primary = 0.01 cfs @ 24.09 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 5.00-41.99 hrs, dt= 0.03 hrs
Peak Elev= 480.98' @ 24.09 hrs Surf.Area= 0.011 ac Storage= 0.011 af

Plug-Flow detention time= 614.1 min calculated for 0.012 af (80% of inflow)
Center-of-Mass det. time= 547.7 min (1,654.7 - 1,107.0)

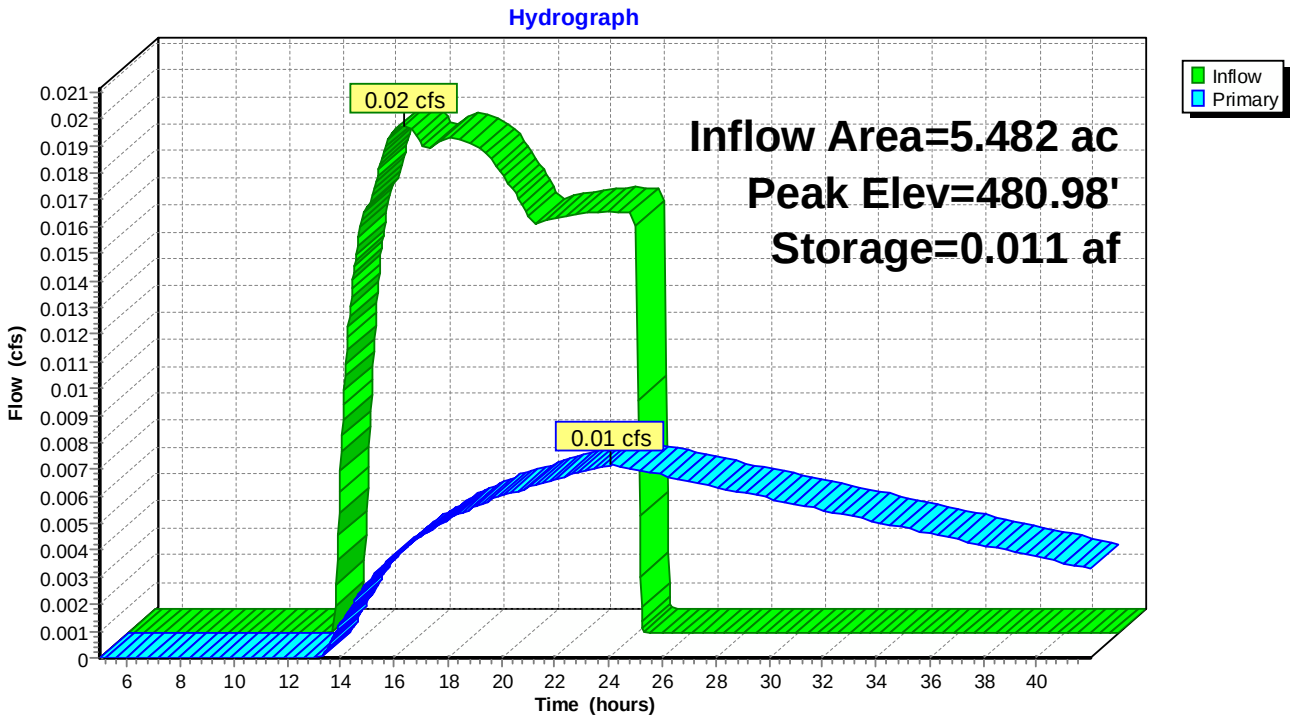
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.022 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.011	0.000	0.000
481.00	0.011	0.011	0.011
482.00	0.011	0.011	0.022

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**1.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.01 cfs @ 24.09 hrs HW=480.98' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.01 cfs @ 1.32 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: CPv Pond



MEADOW RIDGE: PERMIT 2-1107

Source: USGS
Source: NASA, NGA, USGS
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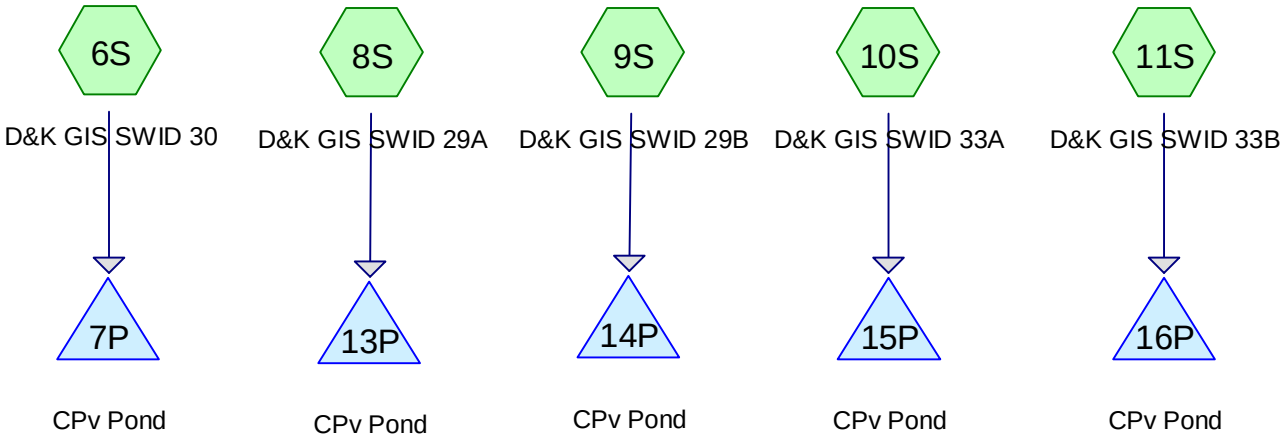

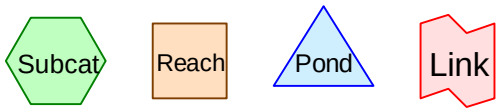

Drainage Diagram for 2-1107- D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
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Summary for Subcatchment 6S: D&K GIS SWID 30

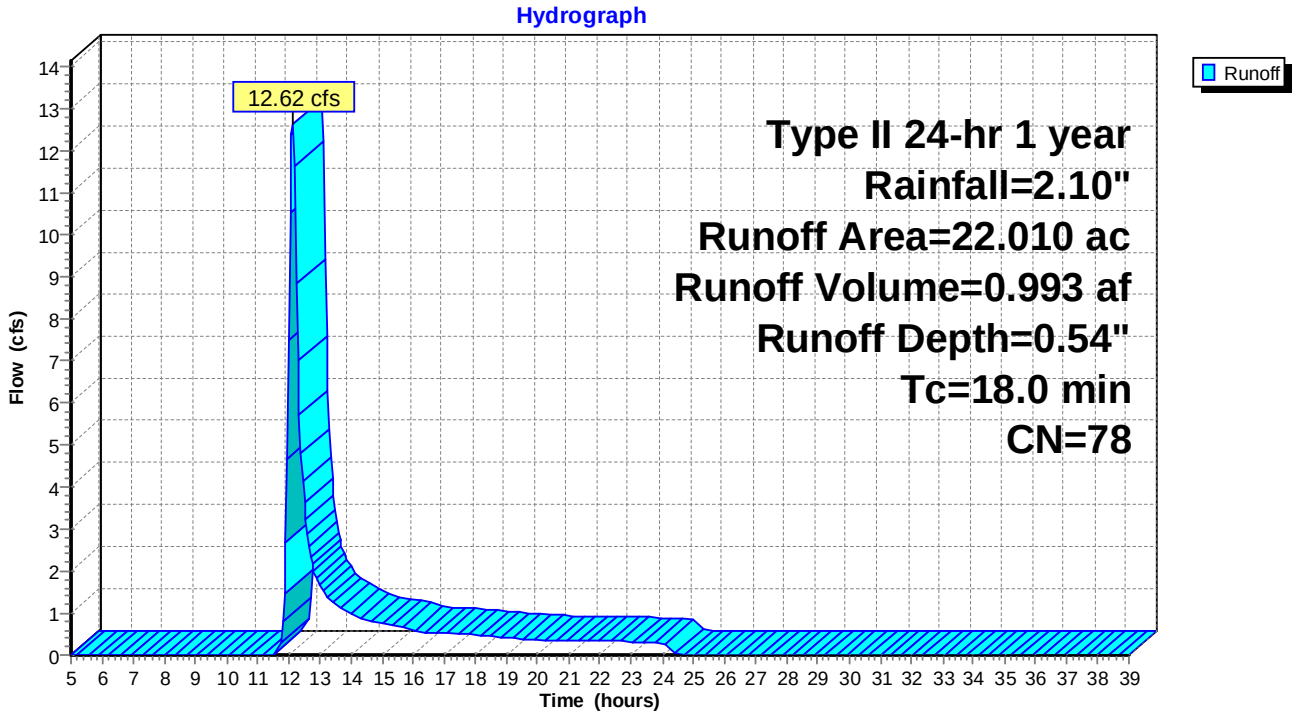
Runoff = 12.62 cfs @ 12.12 hrs, Volume= 0.993 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
14.910	77	2 acre lots, 12% imp, HSG C
4.970	82	2 acre lots, 12% imp, HSG D
1.600	70	Woods, Good, HSG C
0.530	77	Woods, Good, HSG D
22.010	78	Weighted Average
19.624		89.16% Pervious Area
2.386		10.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					**Direct Entry, Permit Tc**

Subcatchment 6S: D&K GIS SWID 30



Summary for Subcatchment 8S: D&K GIS SWID 29A

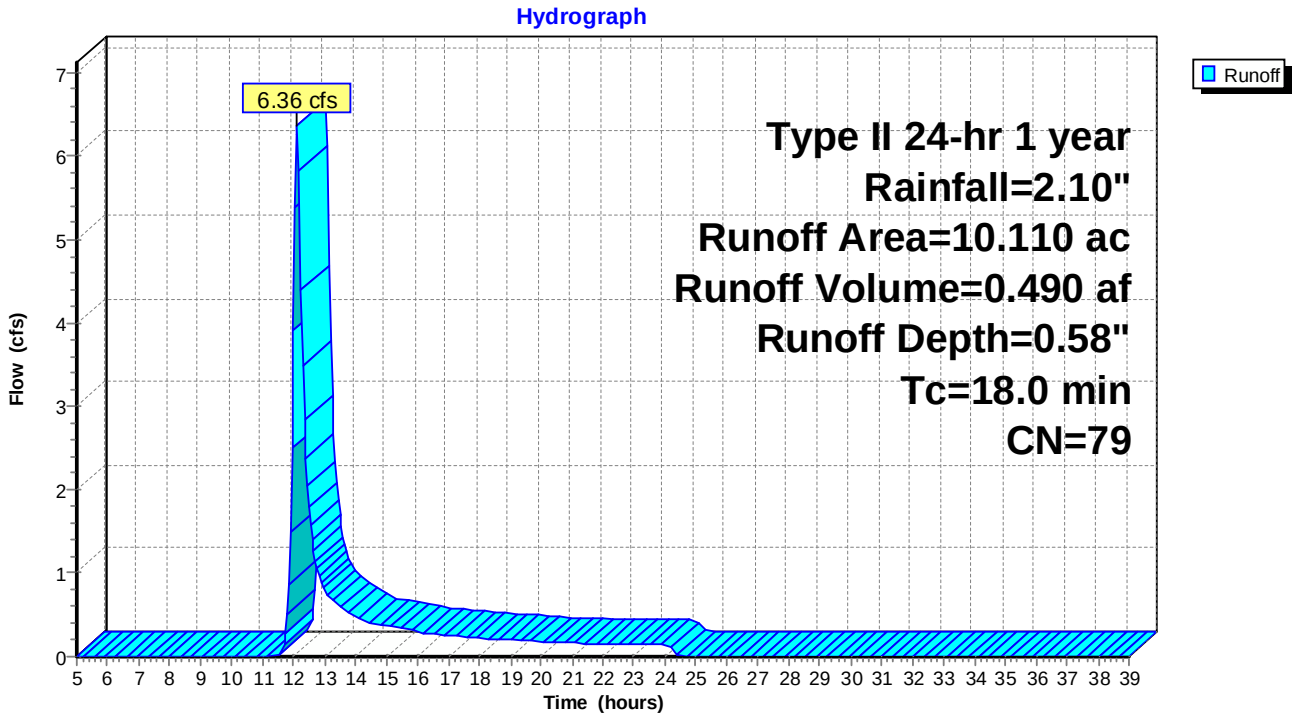
Runoff = 6.36 cfs @ 12.12 hrs, Volume= 0.490 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
5.140	77	2 acre lots, 12% imp, HSG C
4.970	82	2 acre lots, 12% imp, HSG D
10.110	79	Weighted Average
8.897		88.00% Pervious Area
1.213		12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					**Direct Entry, Permit Tc**

Subcatchment 8S: D&K GIS SWID 29A



Summary for Subcatchment 9S: D&K GIS SWID 29B

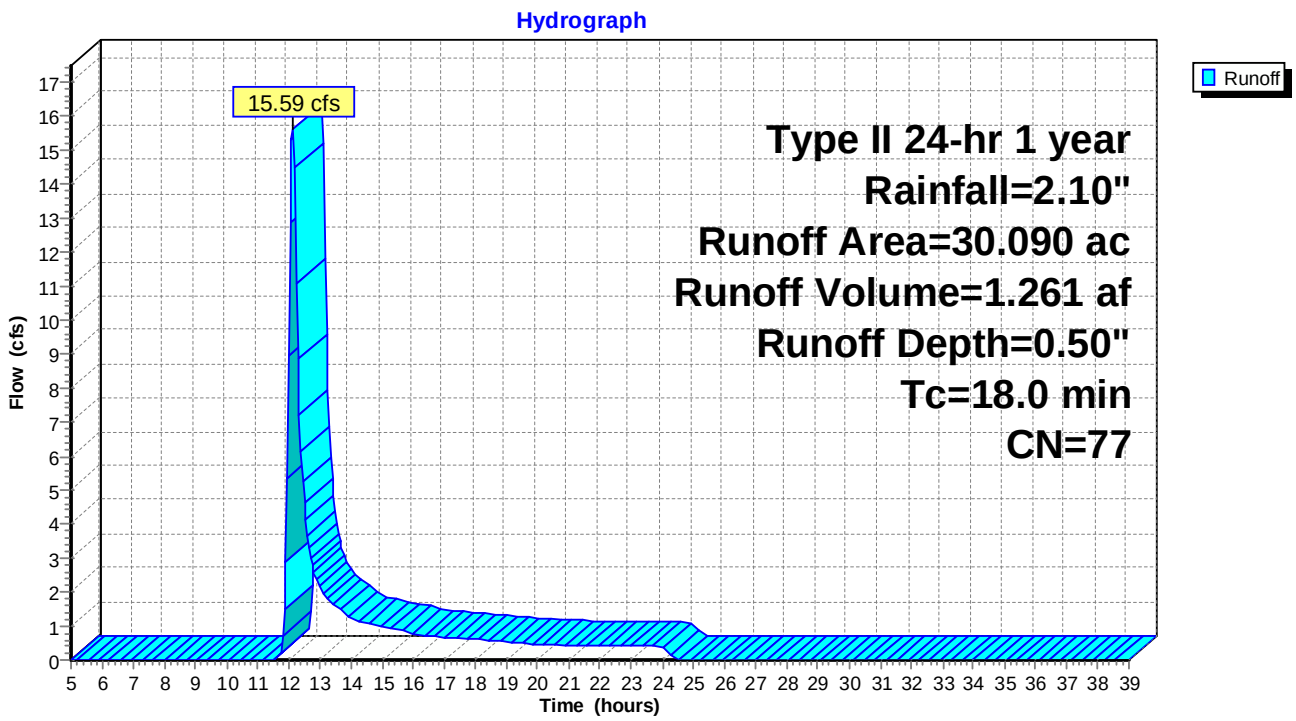
Runoff = 15.59 cfs @ 12.13 hrs, Volume= 1.261 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
17.420	77	2 acre lots, 12% imp, HSG C
5.800	82	2 acre lots, 12% imp, HSG D
5.150	70	Woods, Good, HSG C
1.720	77	Woods, Good, HSG D
30.090	77	Weighted Average
27.304		90.74% Pervious Area
2.786		9.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					**Direct Entry, Permit Tc**

Subcatchment 9S: D&K GIS SWID 29B



Summary for Subcatchment 10S: D&K GIS SWID 33A

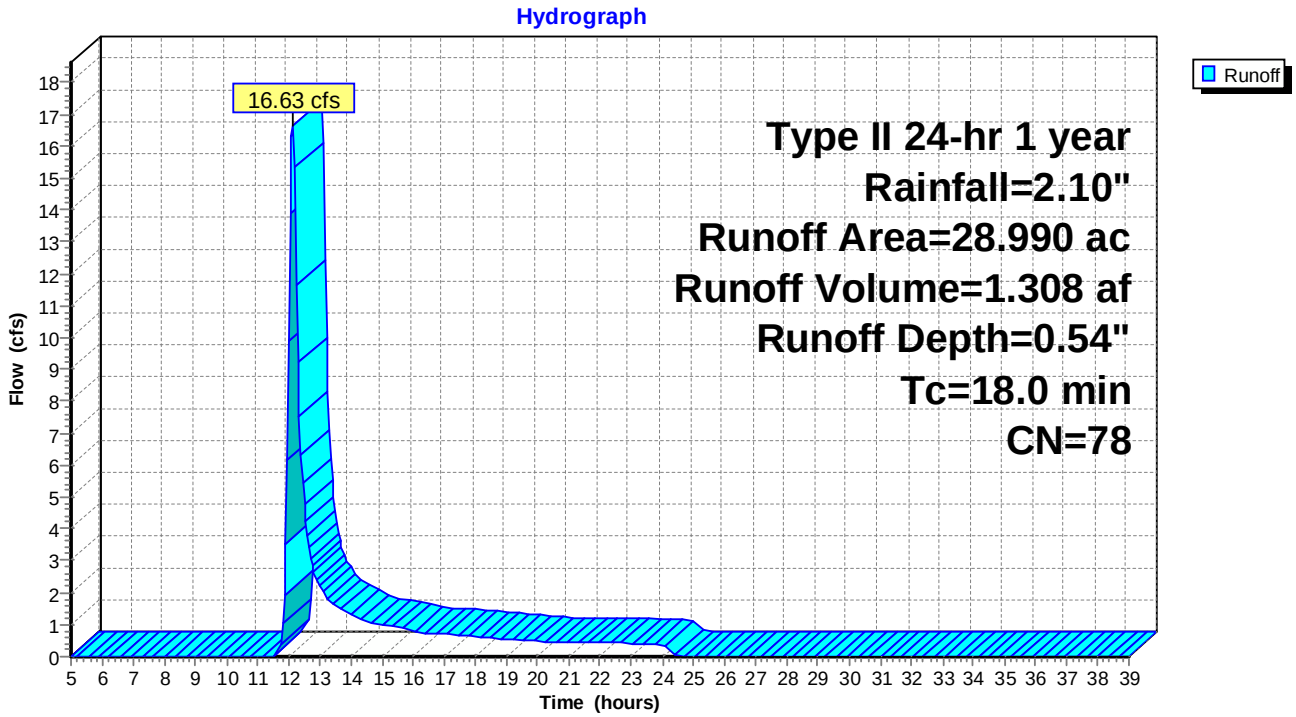
Runoff = 16.63 cfs @ 12.12 hrs, Volume= 1.308 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
21.740	77	2 acre lots, 12% imp, HSG C
7.250	82	2 acre lots, 12% imp, HSG D
28.990	78	Weighted Average
25.511		88.00% Pervious Area
3.479		12.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					**Direct Entry, Permit Tc**

Subcatchment 10S: D&K GIS SWID 33A



Summary for Subcatchment 11S: D&K GIS SWID 33B

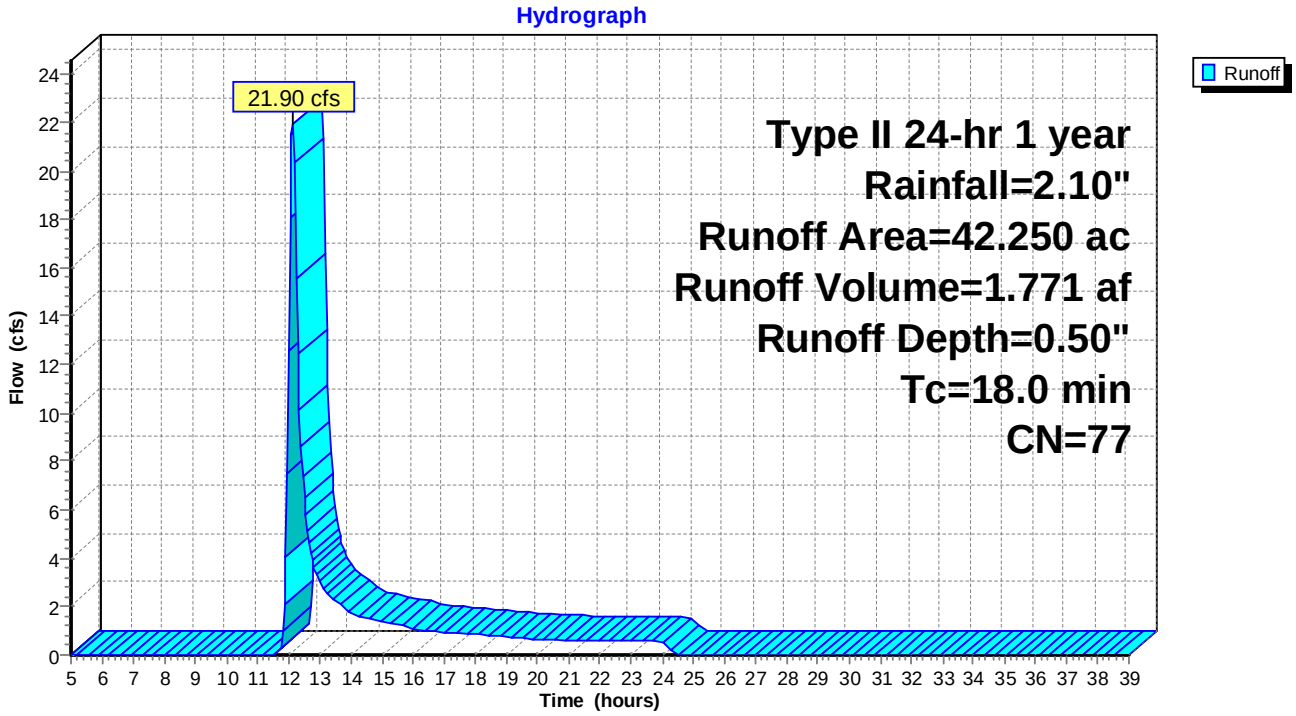
Runoff = 21.90 cfs @ 12.13 hrs, Volume= 1.771 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

Area (ac)	CN	Description
26.930	77	2 acre lots, 12% imp, HSG C
8.980	82	2 acre lots, 12% imp, HSG D
4.760	70	Woods, Good, HSG C
1.580	77	Woods, Good, HSG D
42.250	77	Weighted Average
37.941		89.80% Pervious Area
4.309		10.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0					**Direct Entry, Permit Tc**

Subcatchment 11S: D&K GIS SWID 33B



Summary for Pond 7P: CPv Pond

Inflow Area = 22.010 ac, 10.84% Impervious, Inflow Depth = 0.54" for 1 year event
Inflow = 12.62 cfs @ 12.12 hrs, Volume= 0.993 af
Outflow = 0.09 cfs @ 24.32 hrs, Volume= 0.106 af, Atten= 99%, Lag= 731.6 min
Primary = 0.09 cfs @ 24.32 hrs, Volume= 0.106 af

Routing by Stor-Ind method, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Peak Elev= 480.96' @ 24.32 hrs Surf.Area= 1.000 ac Storage= 0.965 af

Plug-Flow detention time= 985.8 min calculated for 0.106 af (11% of inflow)
Center-of-Mass det. time= 821.3 min (1,705.3 - 884.0)

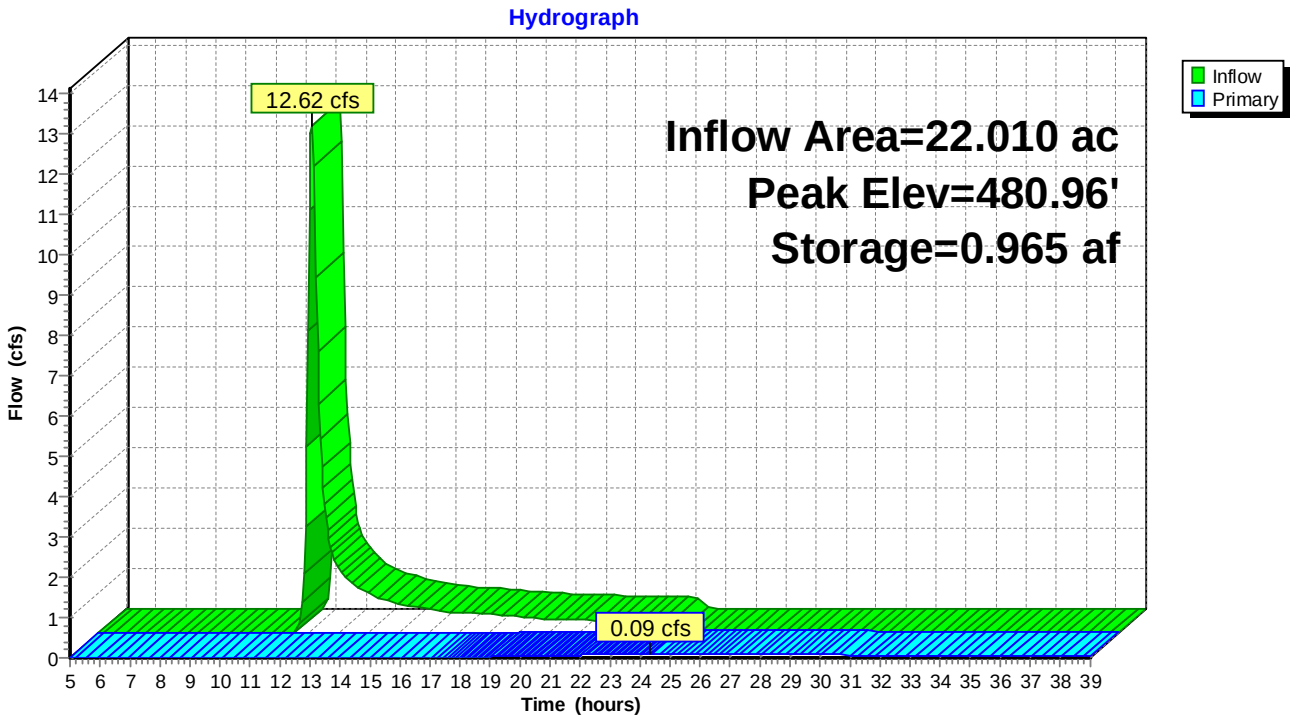
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	2.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	1.000	0.000	0.000
481.00	1.000	1.000	1.000
482.00	1.000	1.000	2.000

Device	Routing	Invert	Outlet Devices
#1	Primary	480.75'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.75' S= -0.0750 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.09 cfs @ 24.32 hrs HW=480.96' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.09 cfs @ 1.58 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: CPv Pond



Summary for Pond 13P: CPv Pond

Inflow Area = 10.110 ac, 12.00% Impervious, Inflow Depth = 0.58" for 1 year event
Inflow = 6.36 cfs @ 12.12 hrs, Volume= 0.490 af
Outflow = 0.01 cfs @ 24.54 hrs, Volume= 0.015 af, Atten= 100%, Lag= 745.1 min
Primary = 0.01 cfs @ 24.54 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Peak Elev= 480.97' @ 24.54 hrs Surf.Area= 0.500 ac Storage= 0.484 af

Plug-Flow detention time= 859.1 min calculated for 0.015 af (3% of inflow)
Center-of-Mass det. time= 690.0 min (1,569.5 - 879.5)

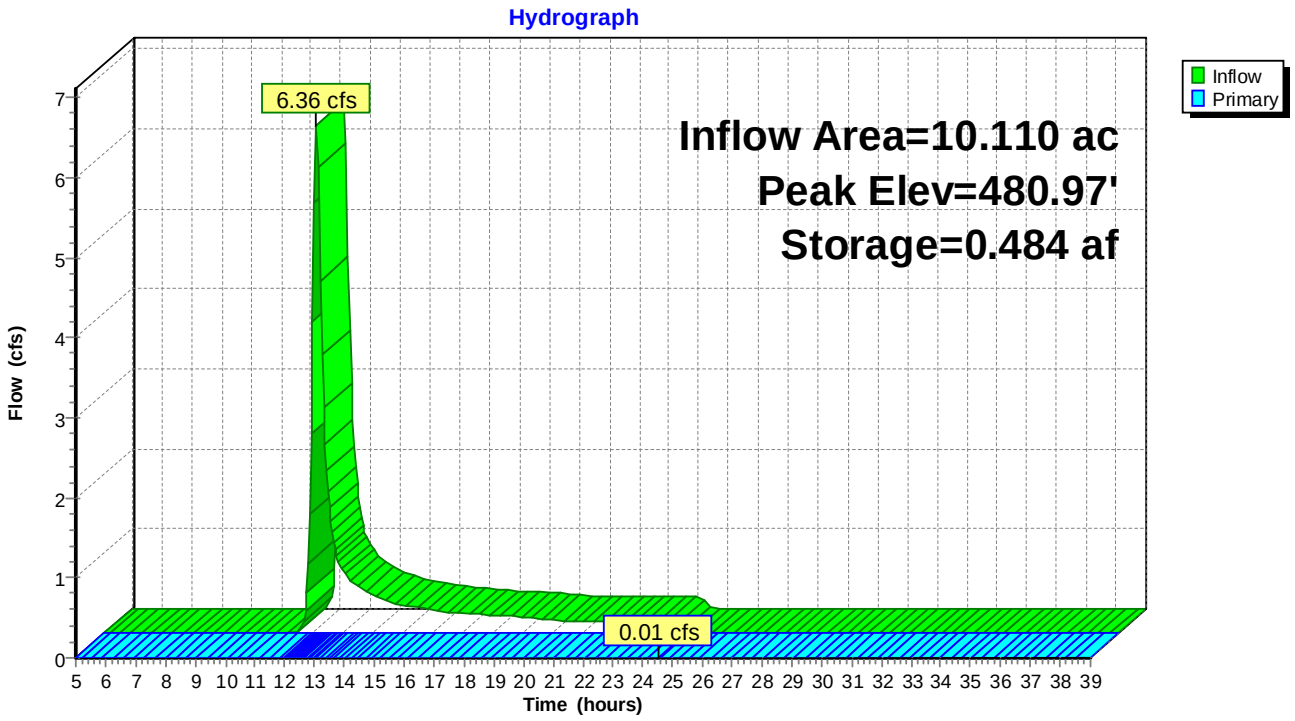
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.500	0.000	0.000
481.00	0.500	0.500	0.500
482.00	0.500	0.500	1.000

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**1.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.01 cfs @ 24.54 hrs HW=480.97' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.01 cfs @ 1.31 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 13P: CPv Pond



Summary for Pond 14P: CPv Pond

Inflow Area = 30.090 ac, 9.26% Impervious, Inflow Depth = 0.50" for 1 year event
Inflow = 15.59 cfs @ 12.13 hrs, Volume= 1.261 af
Outflow = 0.04 cfs @ 24.46 hrs, Volume= 0.081 af, Atten= 100%, Lag= 739.8 min
Primary = 0.04 cfs @ 24.46 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Peak Elev= 480.88' @ 24.46 hrs Surf.Area= 1.400 ac Storage= 1.227 af

Plug-Flow detention time= 858.8 min calculated for 0.080 af (6% of inflow)
Center-of-Mass det. time= 688.2 min (1,576.7 - 888.5)

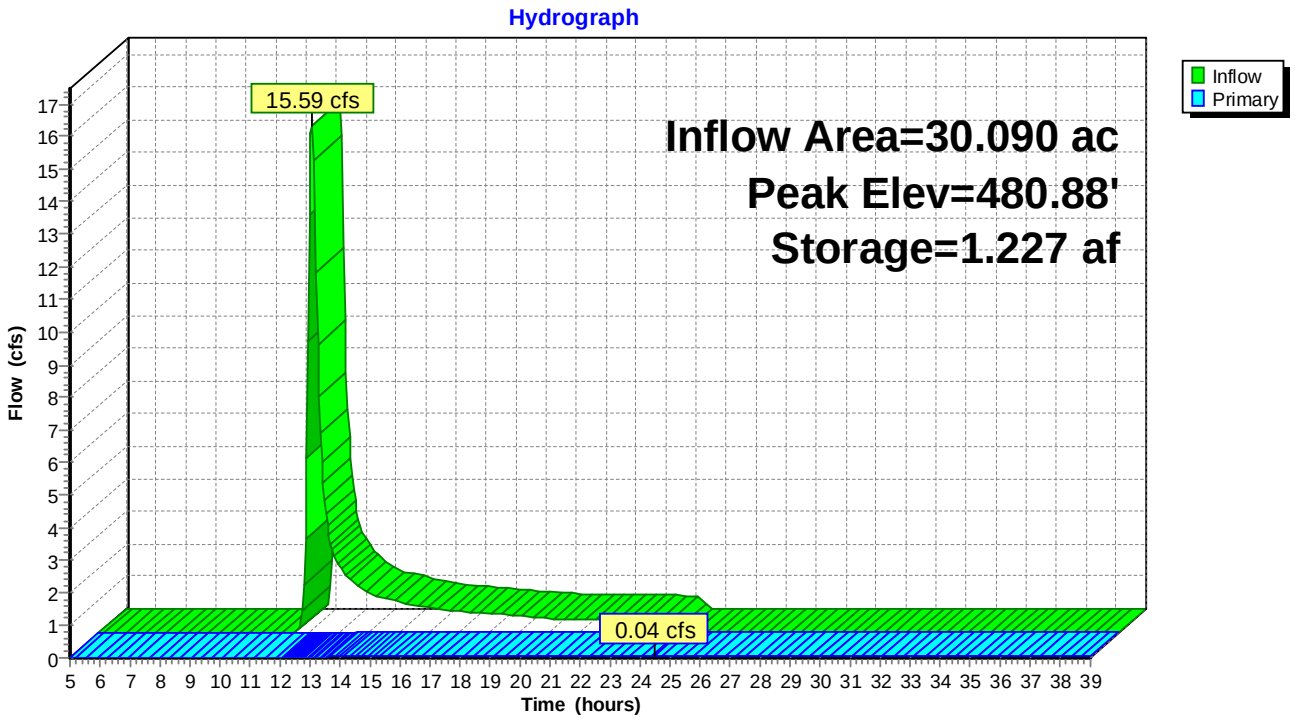
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	2.800 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	1.400	0.000	0.000
481.00	1.400	1.400	1.400
482.00	1.400	1.400	2.800

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.04 cfs @ 24.46 hrs HW=480.88' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.04 cfs @ 1.80 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 14P: CPv Pond



Summary for Pond 15P: CPv Pond

Inflow Area = 28.990 ac, 12.00% Impervious, Inflow Depth = 0.54" for 1 year event
Inflow = 16.63 cfs @ 12.12 hrs, Volume= 1.308 af
Outflow = 0.01 cfs @ 24.66 hrs, Volume= 0.015 af, Atten= 100%, Lag= 752.2 min
Primary = 0.01 cfs @ 24.66 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Peak Elev= 480.96' @ 24.66 hrs Surf.Area= 1.350 ac Storage= 1.302 af

Plug-Flow detention time= 864.2 min calculated for 0.015 af (1% of inflow)
Center-of-Mass det. time= 688.3 min (1,572.3 - 884.0)

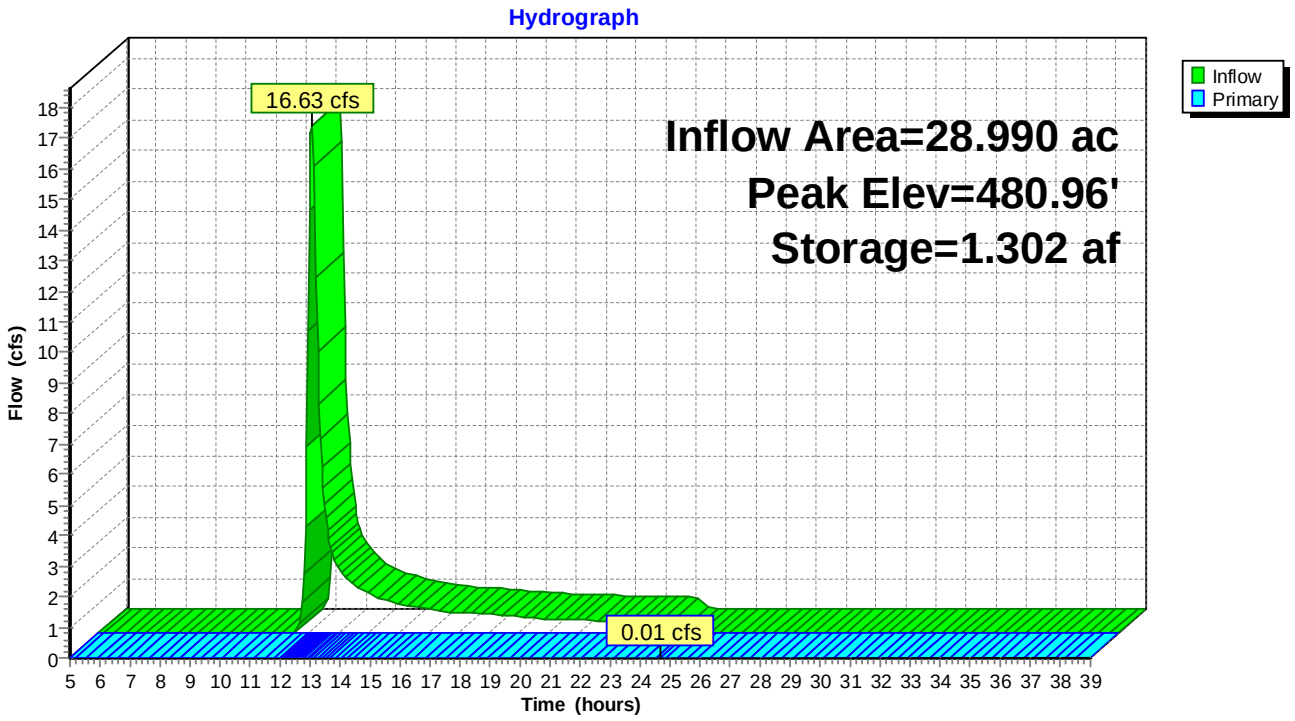
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	2.700 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	1.350	0.000	0.000
481.00	1.350	1.350	1.350
482.00	1.350	1.350	2.700

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**1.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.01 cfs @ 24.66 hrs HW=480.96' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.01 cfs @ 1.30 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 15P: CPv Pond



Summary for Pond 16P: CPv Pond

Inflow Area = 42.250 ac, 10.20% Impervious, Inflow Depth = 0.50" for 1 year event
Inflow = 21.90 cfs @ 12.13 hrs, Volume= 1.771 af
Outflow = 0.26 cfs @ 24.26 hrs, Volume= 0.535 af, Atten= 99%, Lag= 728.2 min
Primary = 0.26 cfs @ 24.26 hrs, Volume= 0.535 af

Routing by Stor-Ind method, Time Span= 5.00-39.00 hrs, dt= 0.05 hrs
Peak Elev= 480.99' @ 24.26 hrs Surf.Area= 1.550 ac Storage= 1.534 af

Plug-Flow detention time= 823.3 min calculated for 0.535 af (30% of inflow)
Center-of-Mass det. time= 661.3 min (1,549.9 - 888.5)

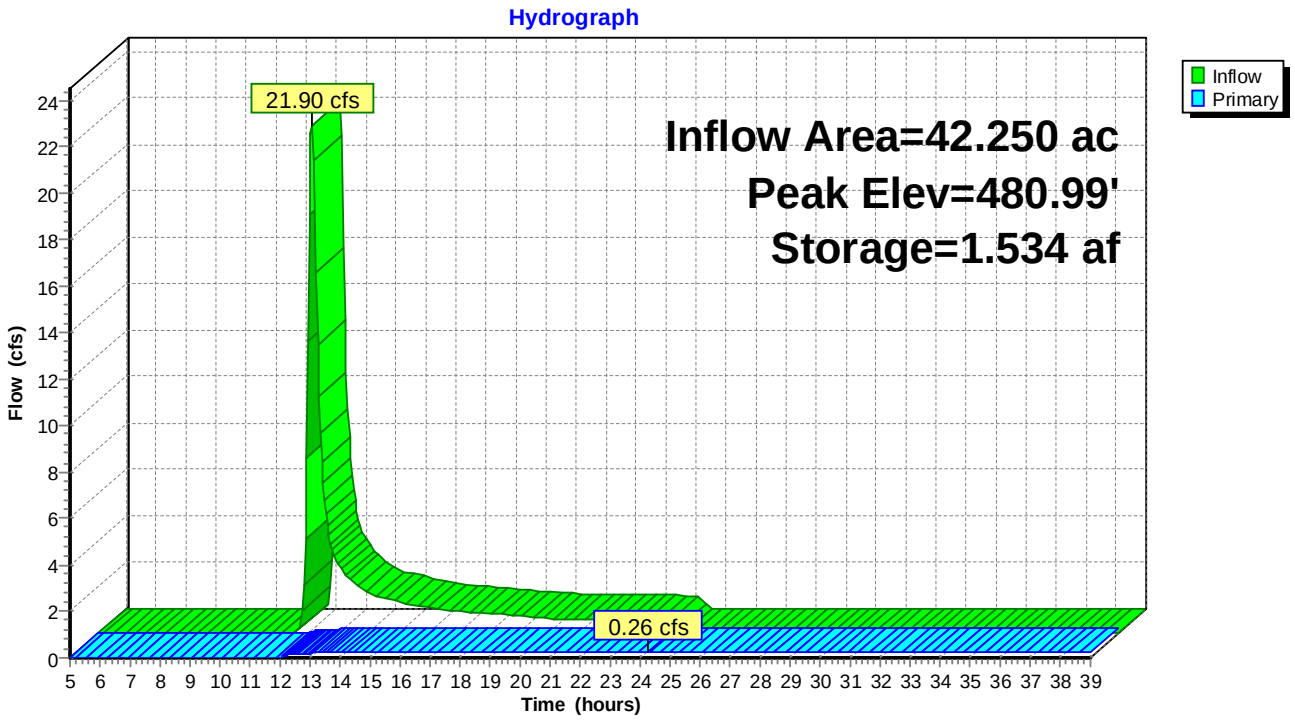
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	3.100 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	1.550	0.000	0.000
481.00	1.550	1.550	1.550
482.00	1.550	1.550	3.100

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.75' S= 0.0250 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.26 cfs @ 24.26 hrs HW=480.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.26 cfs @ 2.99 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 16P: CPv Pond



OLD STAGE ESTATES: PERMIT 2-1146

Source: USGS
Source: NASA, NGA, USGS
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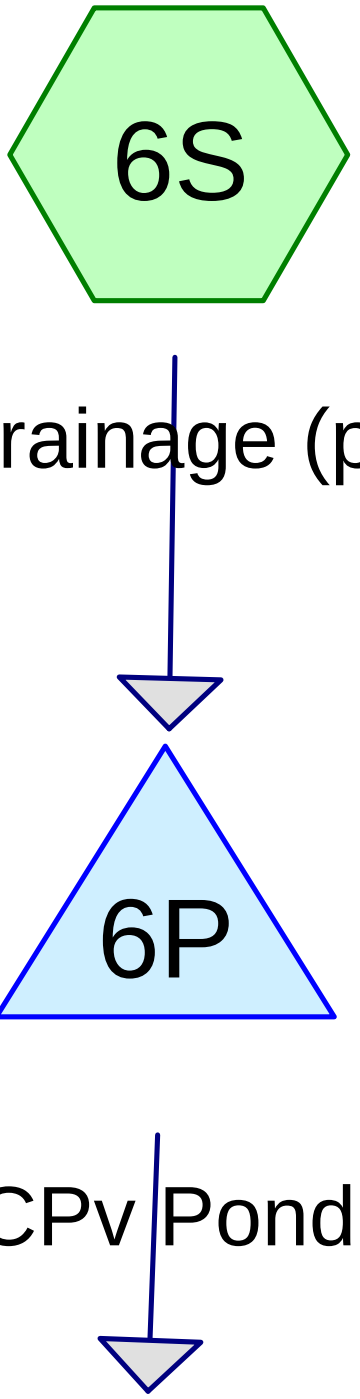

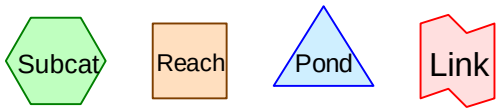

Drainage Diagram for 2-1180DB1- D&K
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Summary for Subcatchment 6S: North drainage (pioneer)

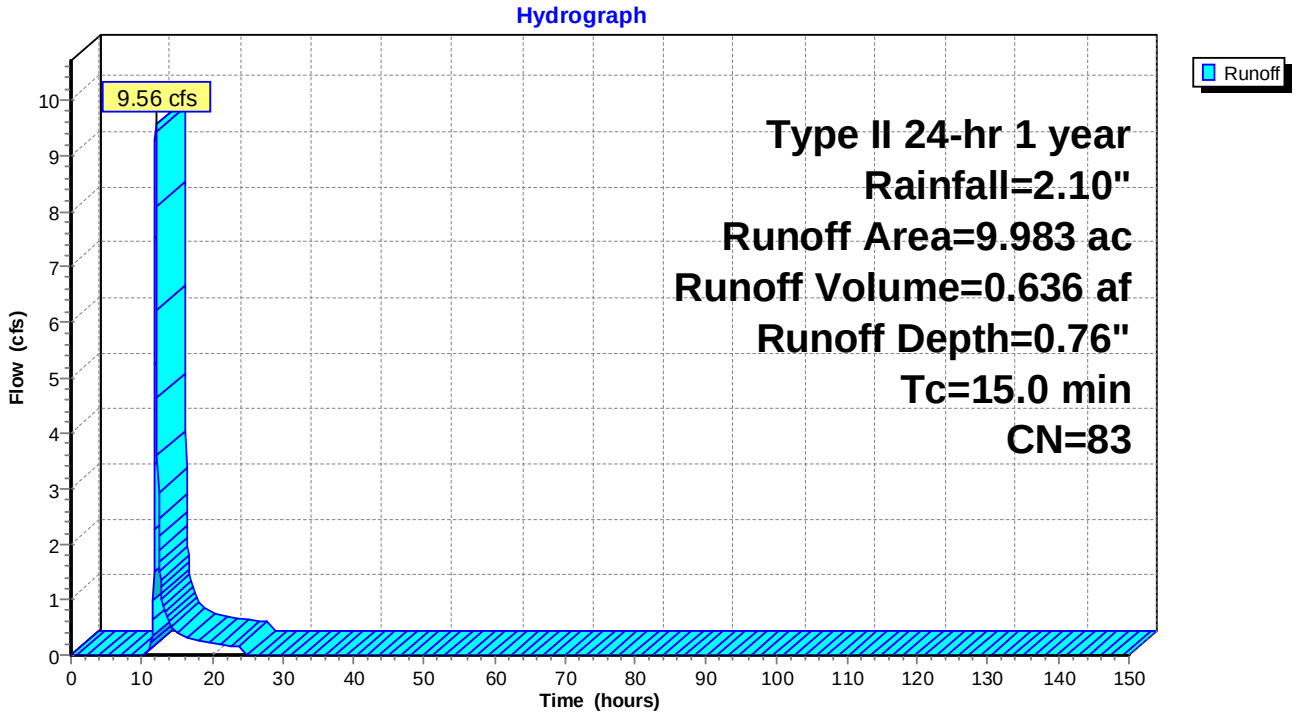
Runoff = 9.56 cfs @ 12.08 hrs, Volume= 0.636 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-150.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
	1.310	70	1/2 acre lots, 25% imp, HSG B
	4.796	80	1/2 acre lots, 25% imp, HSG C
	2.427	85	1/2 acre lots, 25% imp, HSG D
*	1.450	98	
	9.983	83	Weighted Average
	6.400		64.11% Pervious Area
	3.583		35.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 6S: North drainage (pioneer)



Summary for Pond 6P: CPv Pond

Inflow Area = 9.983 ac, 35.89% Impervious, Inflow Depth = 0.76" for 1 year event
Inflow = 9.56 cfs @ 12.08 hrs, Volume= 0.636 af
Outflow = 0.29 cfs @ 17.00 hrs, Volume= 0.629 af, Atten= 97%, Lag= 295.0 min
Primary = 0.29 cfs @ 17.00 hrs, Volume= 0.629 af

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.05 hrs
Peak Elev= 480.99' @ 17.00 hrs Surf.Area= 0.400 ac Storage= 0.396 af

Plug-Flow detention time= 839.5 min calculated for 0.629 af (99% of inflow)
Center-of-Mass det. time= 833.2 min (1,693.1 - 859.9)

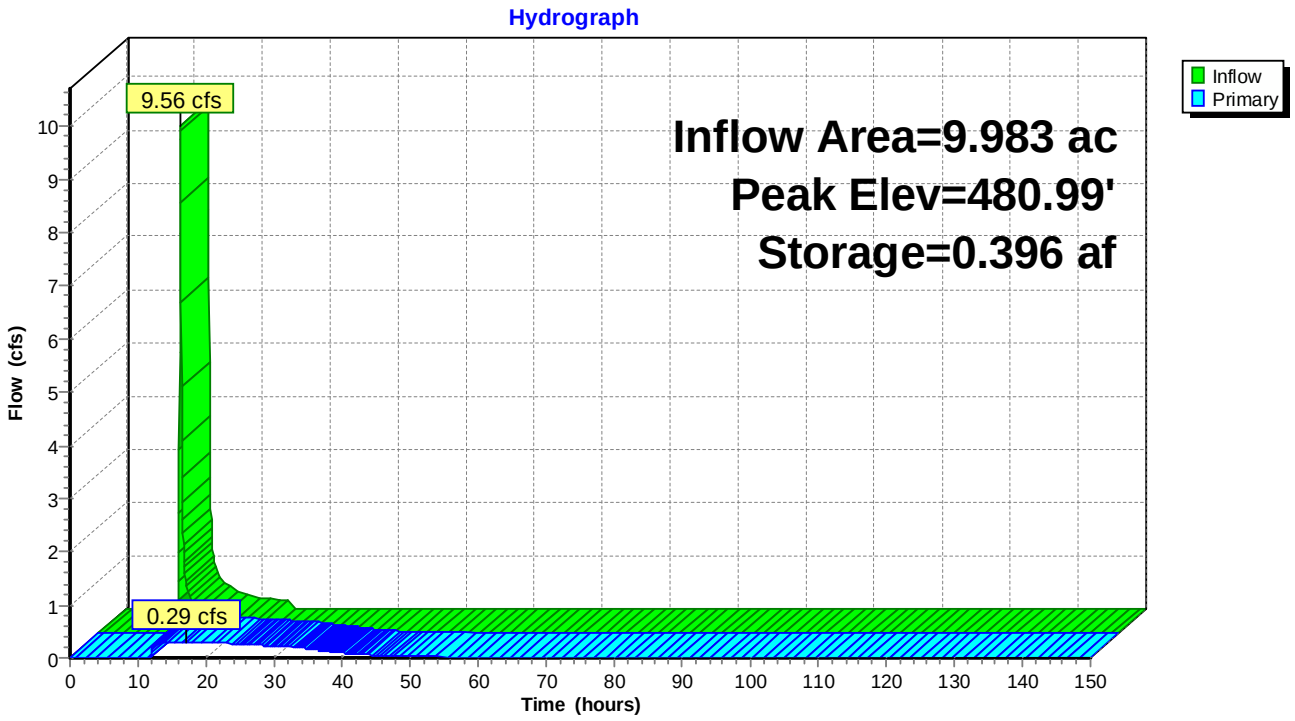
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.800 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

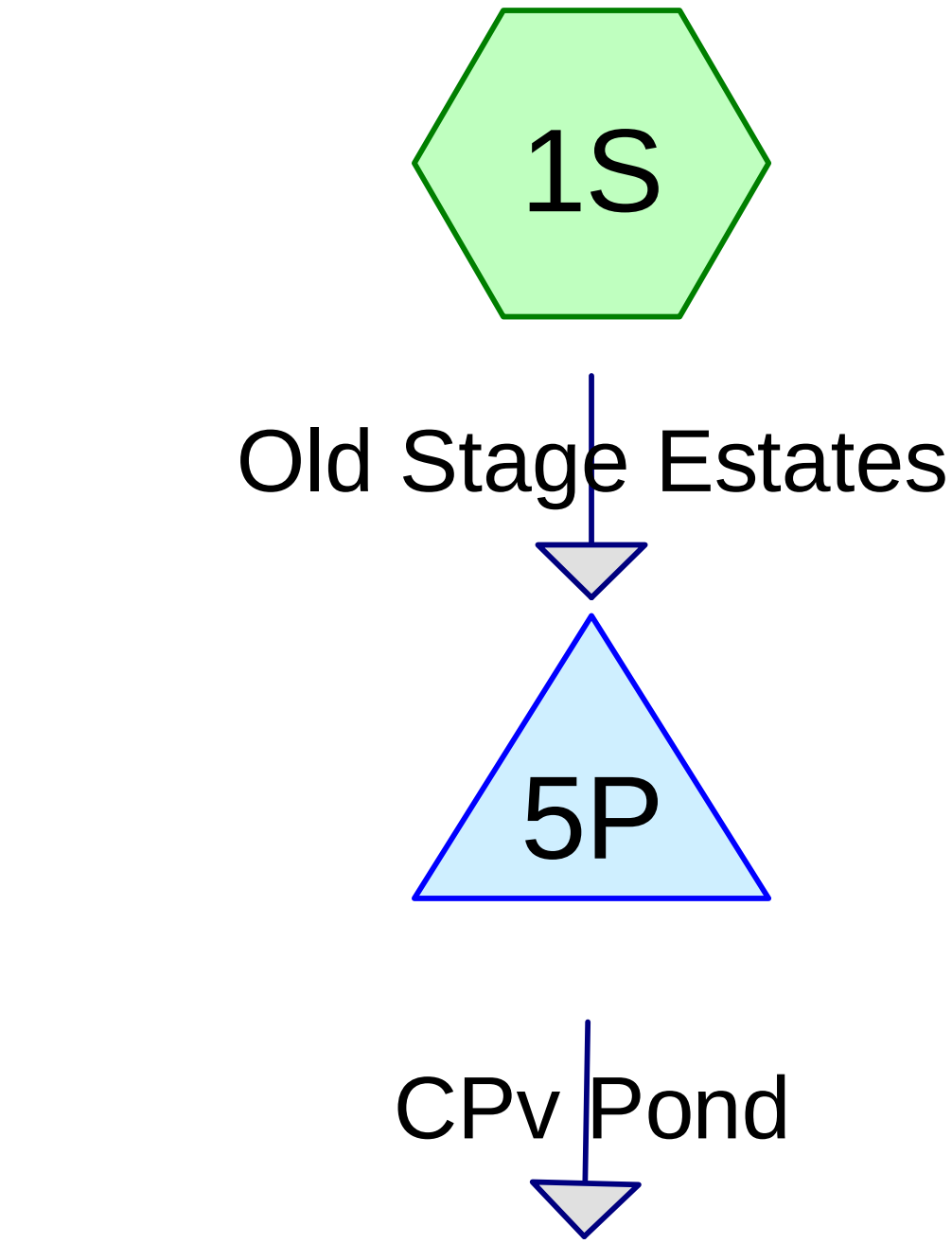
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.400	0.000	0.000
481.00	0.400	0.400	0.400
482.00	0.400	0.400	0.800

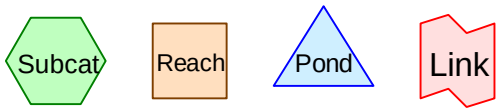
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.29 cfs @ 17.00 hrs HW=480.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.29 cfs @ 3.38 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: CPv Pond







Drainage Diagram for 2-1146DB2- D&K
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Summary for Subcatchment 1S: Old Stage Estates

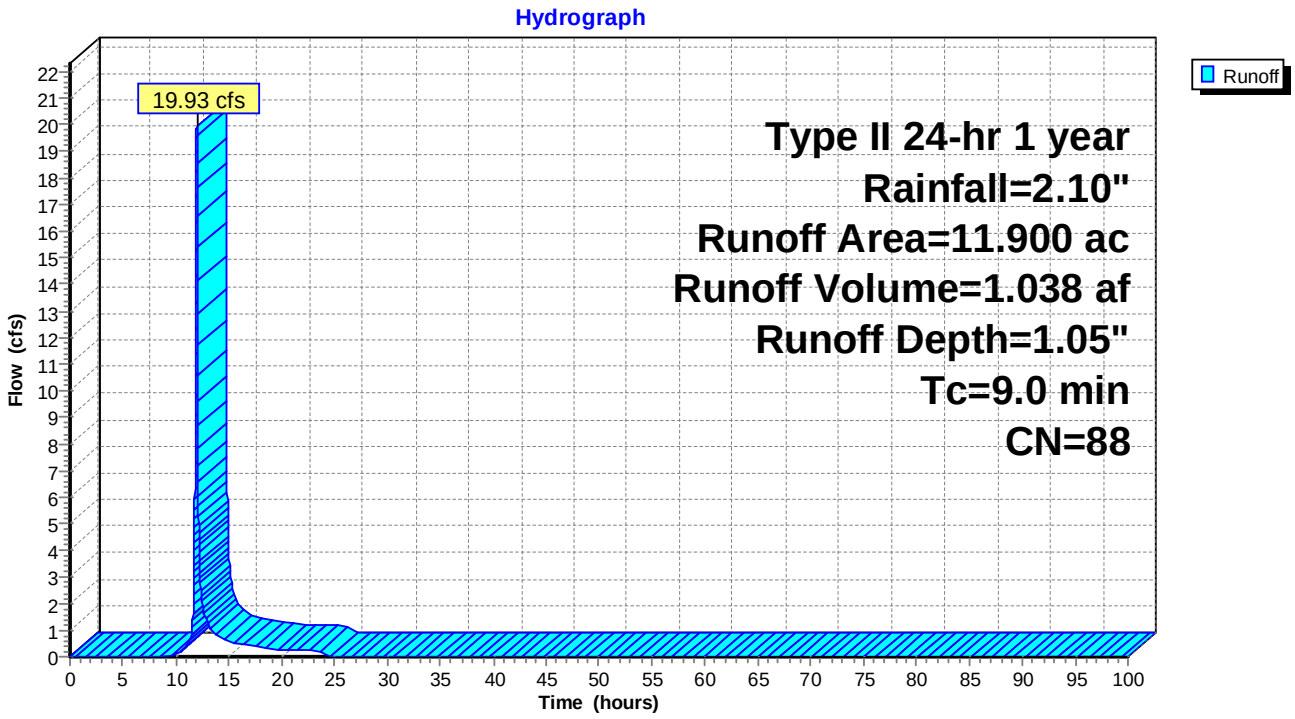
Runoff = 19.93 cfs @ 12.01 hrs, Volume= 1.038 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	11.900	88	
	11.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0					**Direct Entry,**

Subcatchment 1S: Old Stage Estates



Summary for Pond 5P: CPv Pond

Inflow Area = 11.900 ac, 0.00% Impervious, Inflow Depth = 1.05" for 1 year event
Inflow = 19.93 cfs @ 12.01 hrs, Volume= 1.038 af
Outflow = 0.49 cfs @ 15.89 hrs, Volume= 1.008 af, Atten= 98%, Lag= 232.6 min
Primary = 0.49 cfs @ 15.89 hrs, Volume= 1.008 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 480.96' @ 15.89 hrs Surf.Area= 0.700 ac Storage= 0.672 af

Plug-Flow detention time= 853.4 min calculated for 1.008 af (97% of inflow)
Center-of-Mass det. time= 836.5 min (1,669.7 - 833.2)

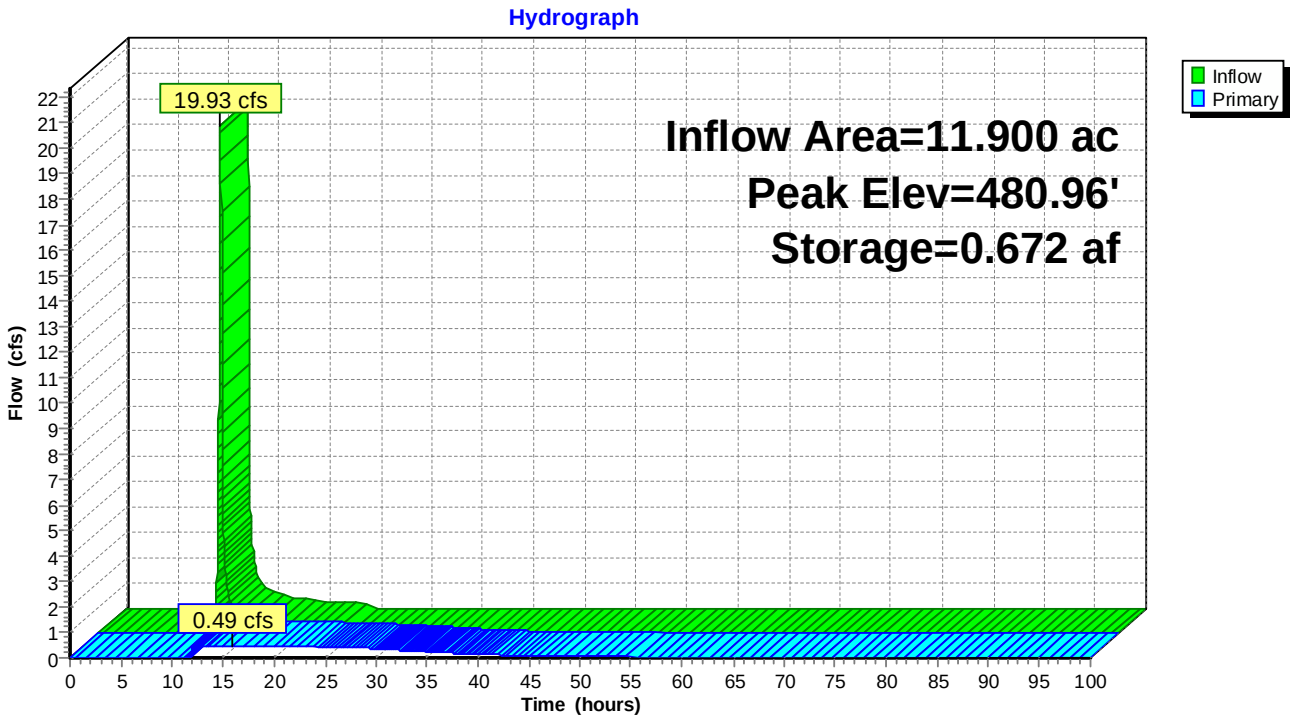
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.400 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

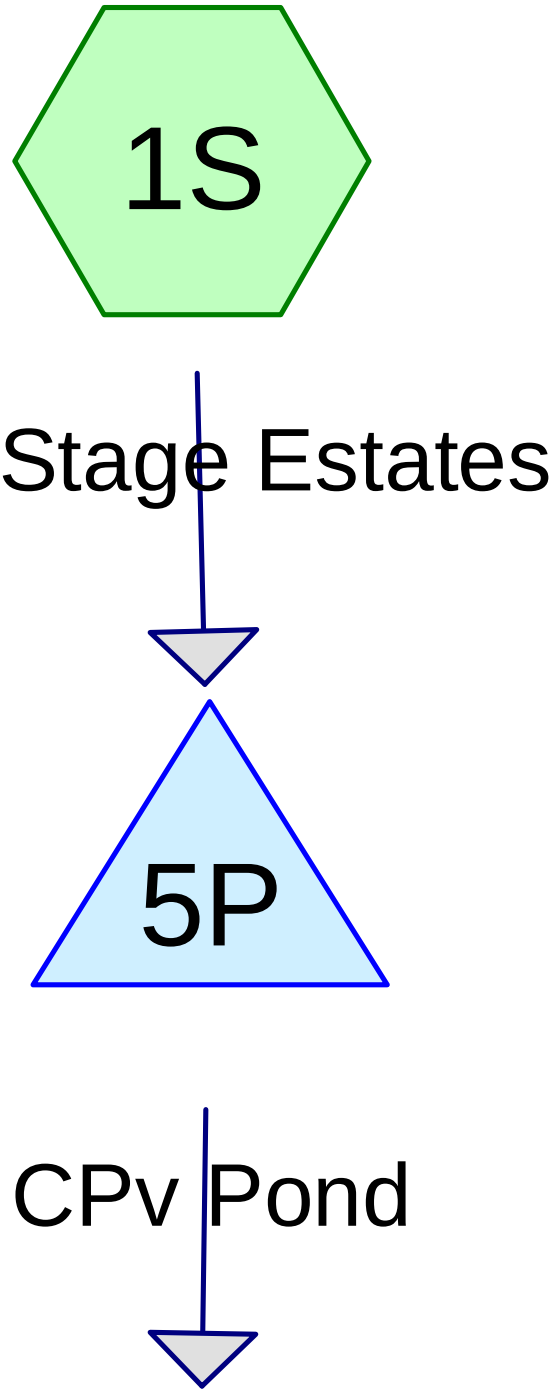
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.700	0.000	0.000
481.00	0.700	0.700	0.700
482.00	0.700	0.700	1.400

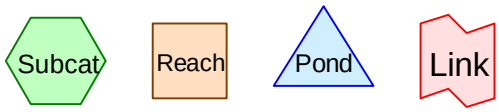
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**5.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.49 cfs @ 15.89 hrs HW=480.96' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.49 cfs @ 3.58 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond







Drainage Diagram for 2-1146DB3 - D&K
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Summary for Subcatchment 1S: Old Stage Estates

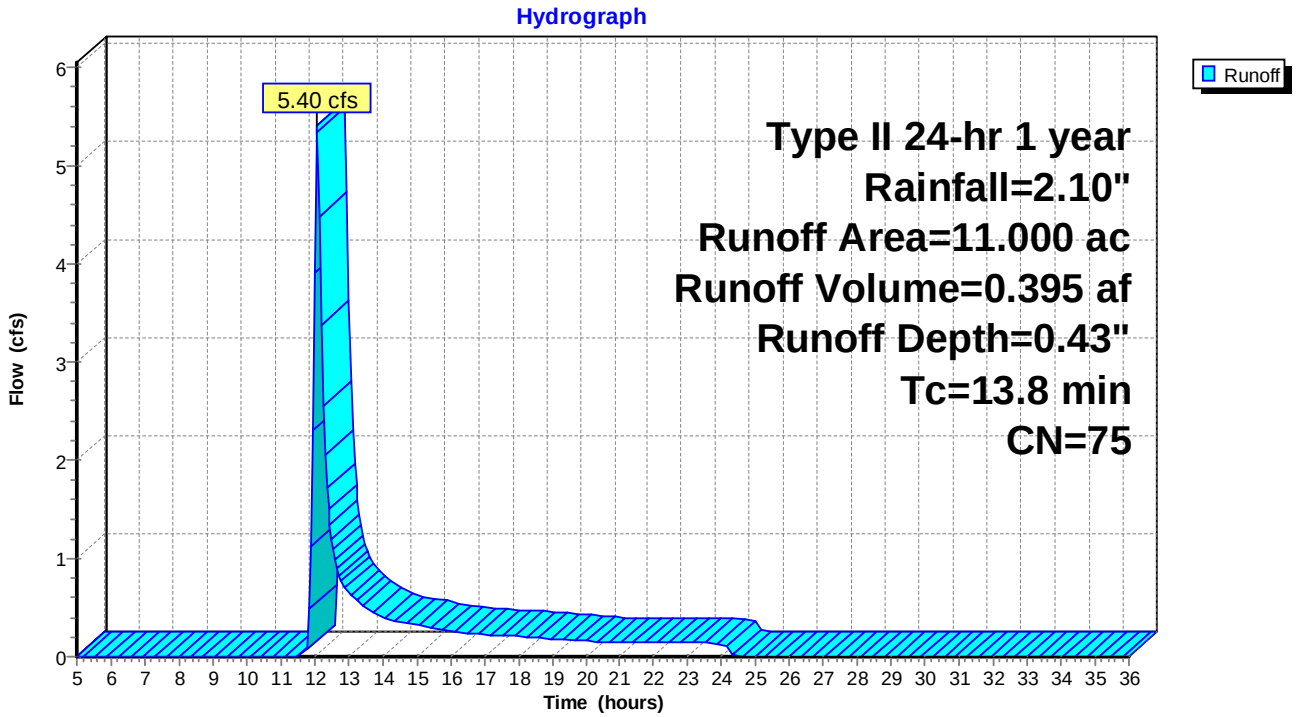
Runoff = 5.40 cfs @ 12.08 hrs, Volume= 0.395 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
	10.700	74	>75% Grass cover, Good, HSG C
*	0.300	98	
	11.000	75	Weighted Average
	10.700		97.27% Pervious Area
	0.300		2.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8					**Direct Entry,**

Subcatchment 1S: Old Stage Estates



Summary for Pond 5P: CPv Pond

Inflow Area = 11.000 ac, 2.73% Impervious, Inflow Depth = 0.43" for 1 year event
Inflow = 5.40 cfs @ 12.08 hrs, Volume= 0.395 af
Outflow = 0.04 cfs @ 24.25 hrs, Volume= 0.073 af, Atten= 99%, Lag= 730.0 min
Primary = 0.04 cfs @ 24.25 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 480.92' @ 24.25 hrs Surf.Area= 0.390 ac Storage= 0.360 af

Plug-Flow detention time= 755.9 min calculated for 0.073 af (18% of inflow)
Center-of-Mass det. time= 582.7 min (1,477.1 - 894.4)

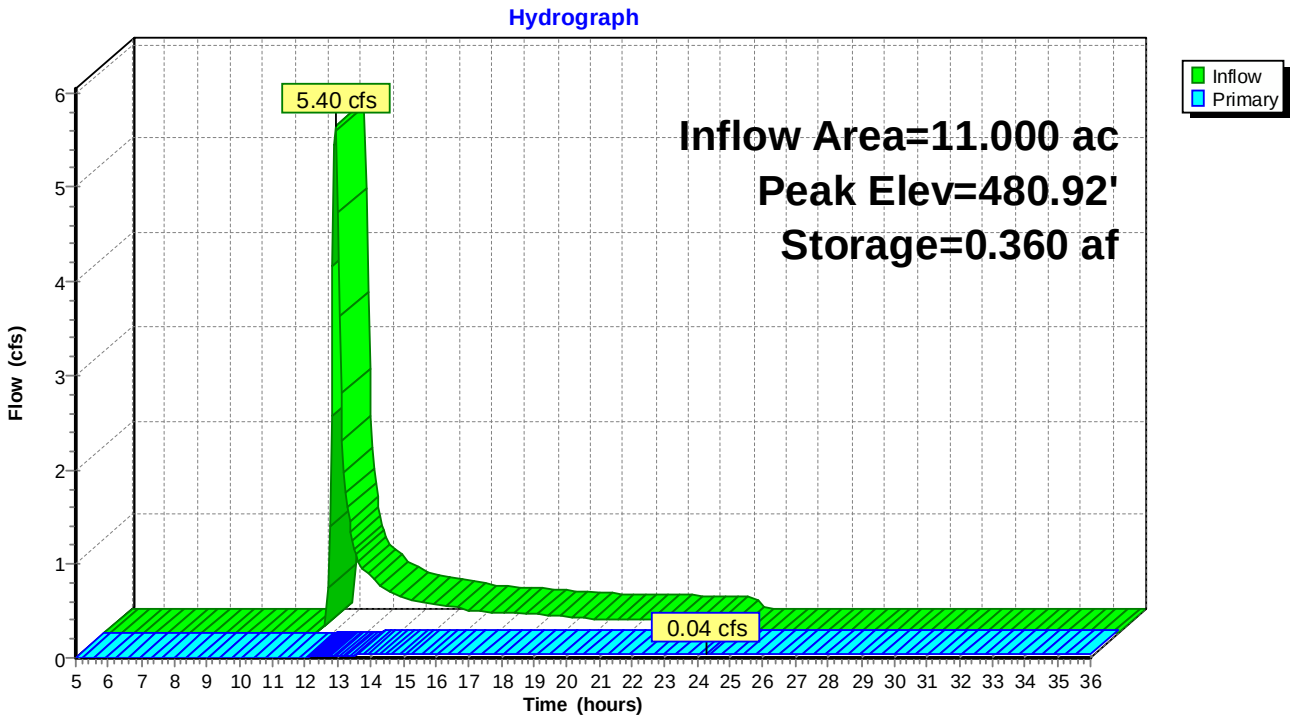
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.780 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.390	0.000	0.000
481.00	0.390	0.390	0.390
482.00	0.390	0.390	0.780

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.04 cfs @ 24.25 hrs HW=480.92' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.04 cfs @ 1.85 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



GOLF LINKS: PERMIT 2-1180

Source: USGS
Source: NASA, NGA, USGS
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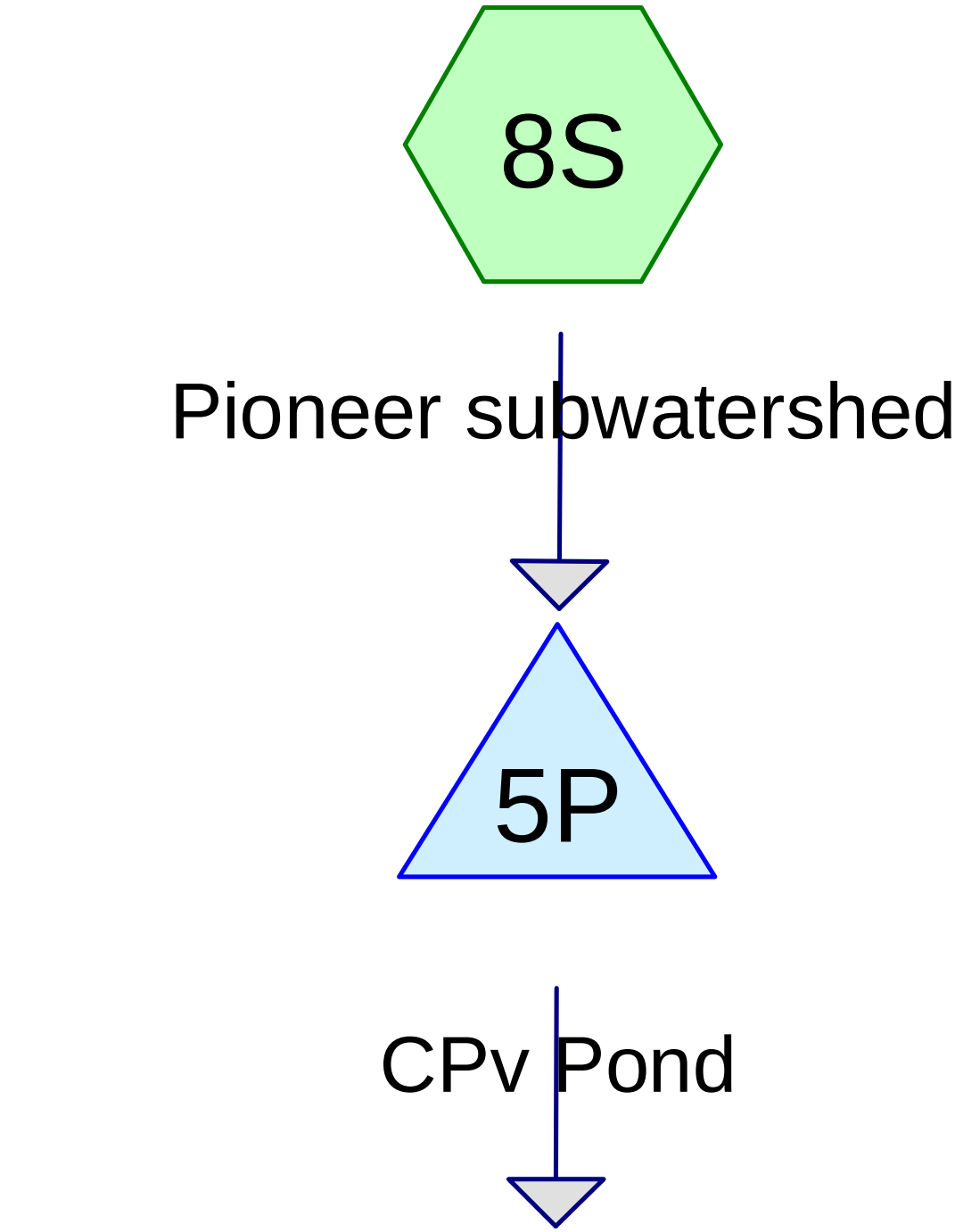

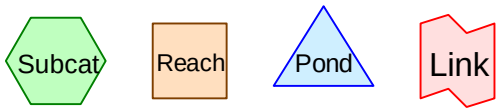

Drainage Diagram for 2-1180DB2-D&K
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Summary for Subcatchment 8S: Pioneer subwatershed

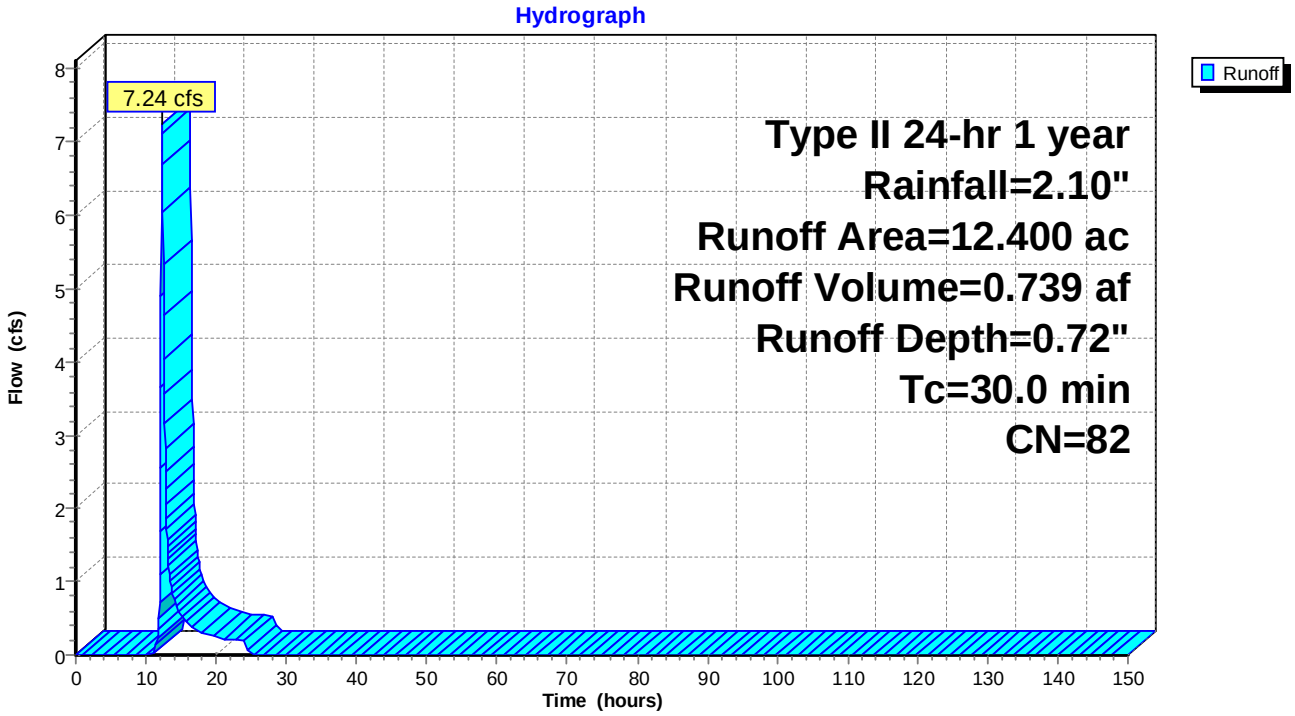
Runoff = 7.24 cfs @ 12.26 hrs, Volume= 0.739 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-150.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
	2.820	70	1/2 acre lots, 25% imp, HSG B
	2.350	80	1/2 acre lots, 25% imp, HSG C
	5.550	85	1/2 acre lots, 25% imp, HSG D
*	1.680	98	
	12.400	82	Weighted Average
	8.040		64.84% Pervious Area
	4.360		35.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0					**Direct Entry,**

Subcatchment 8S: Pioneer subwatershed



Summary for Pond 5P: CPv Pond

Inflow Area = 12.400 ac, 35.16% Impervious, Inflow Depth = 0.72" for 1 year event
Inflow = 7.24 cfs @ 12.26 hrs, Volume= 0.739 af
Outflow = 0.40 cfs @ 16.26 hrs, Volume= 0.727 af, Atten= 94%, Lag= 239.9 min
Primary = 0.40 cfs @ 16.26 hrs, Volume= 0.727 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.05 hrs
Peak Elev= 490.87' @ 16.26 hrs Surf.Area= 0.500 ac Storage= 0.437 af

Plug-Flow detention time= 781.5 min calculated for 0.726 af (98% of inflow)
Center-of-Mass det. time= 773.7 min (1,651.6 - 877.9)

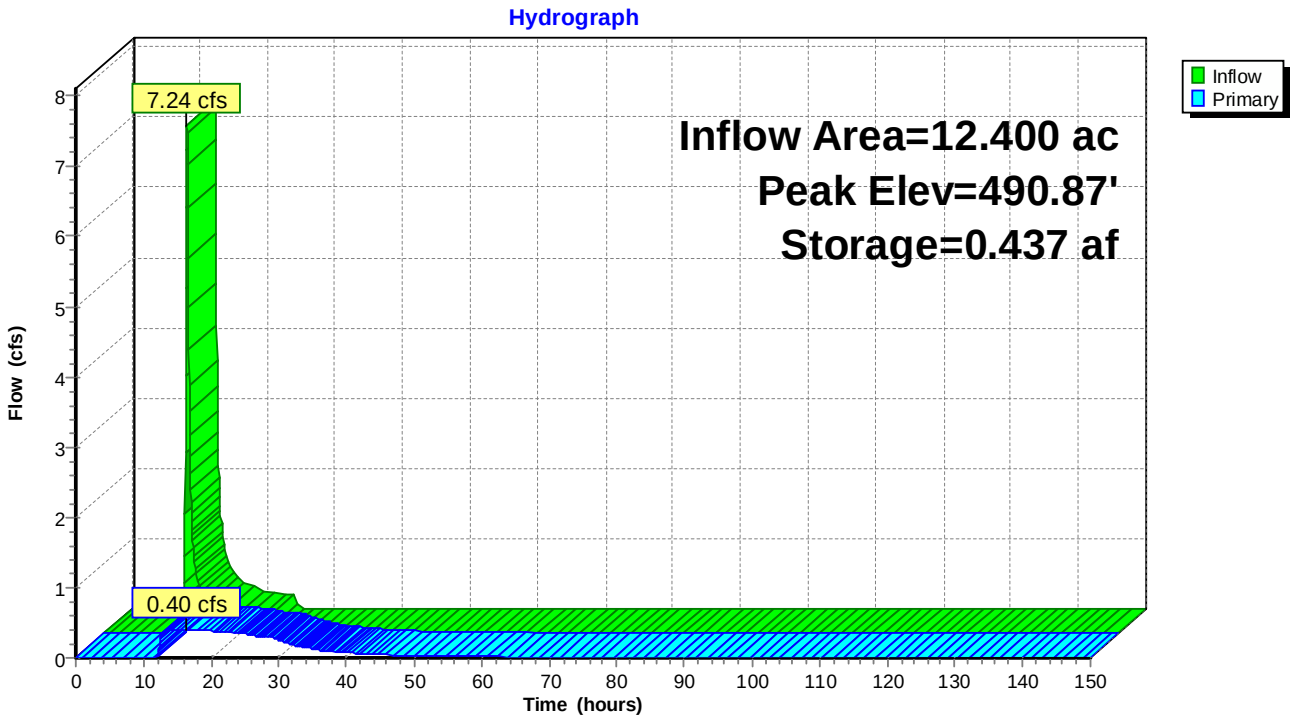
Volume	Invert	Avail.Storage	Storage Description
#1	490.00'	1.000 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
490.00	0.500	0.000	0.000
491.00	0.500	0.500	0.500
492.00	0.500	0.500	1.000

Device	Routing	Invert	Outlet Devices
#1	Primary	490.00'	**5.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 490.00' / 489.75' S= 0.0250 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	491.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.40 cfs @ 16.26 hrs HW=490.87' TW=485.35' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.40 cfs @ 2.95 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



MEADOW RUN: PERMIT 2-1191

Source: USGS
Source: NASA, NGA, USGS
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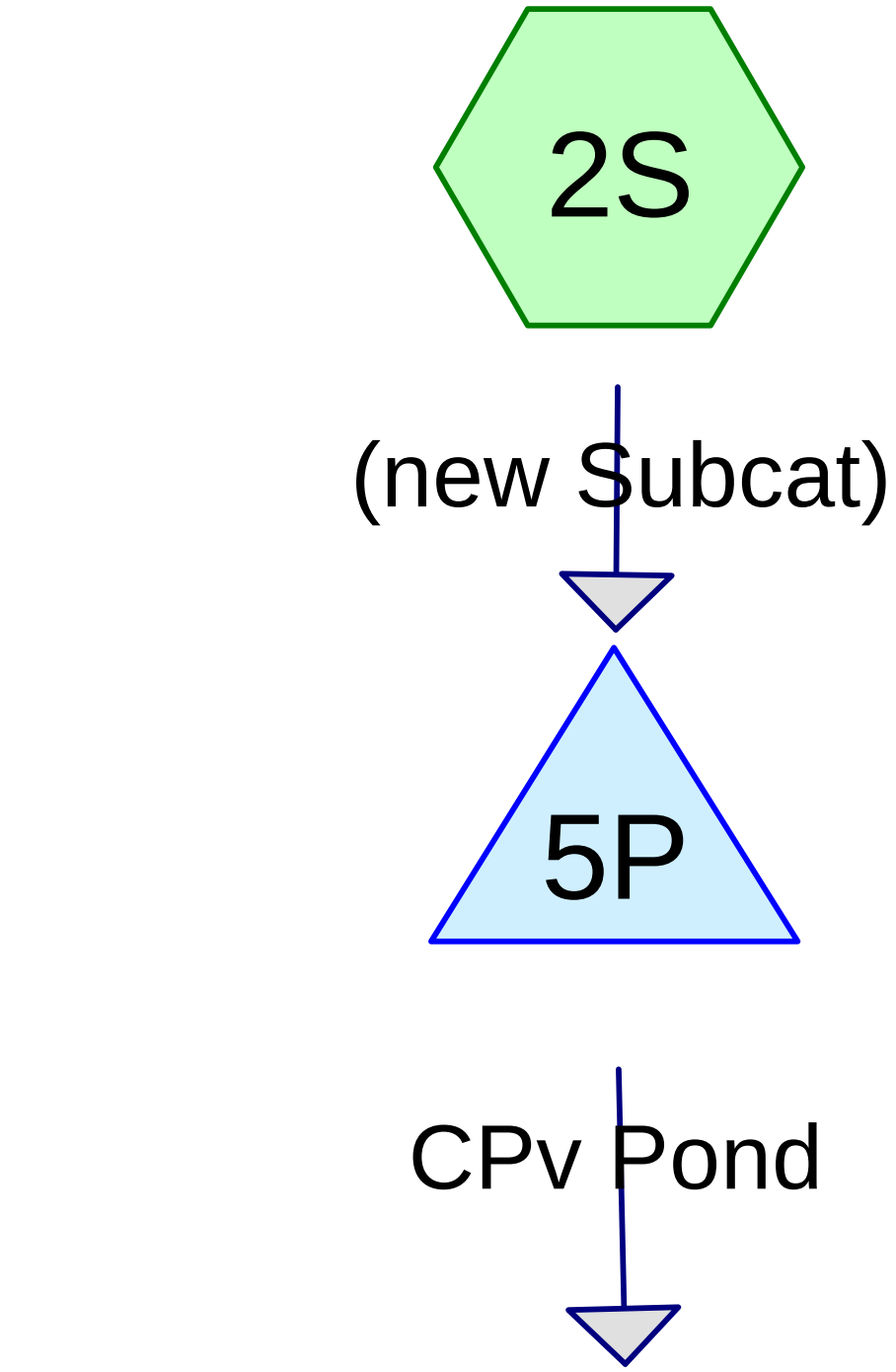

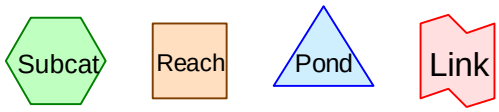

Drainage Diagram for 2-1190- D&K
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Summary for Subcatchment 2S: (new Subcat)

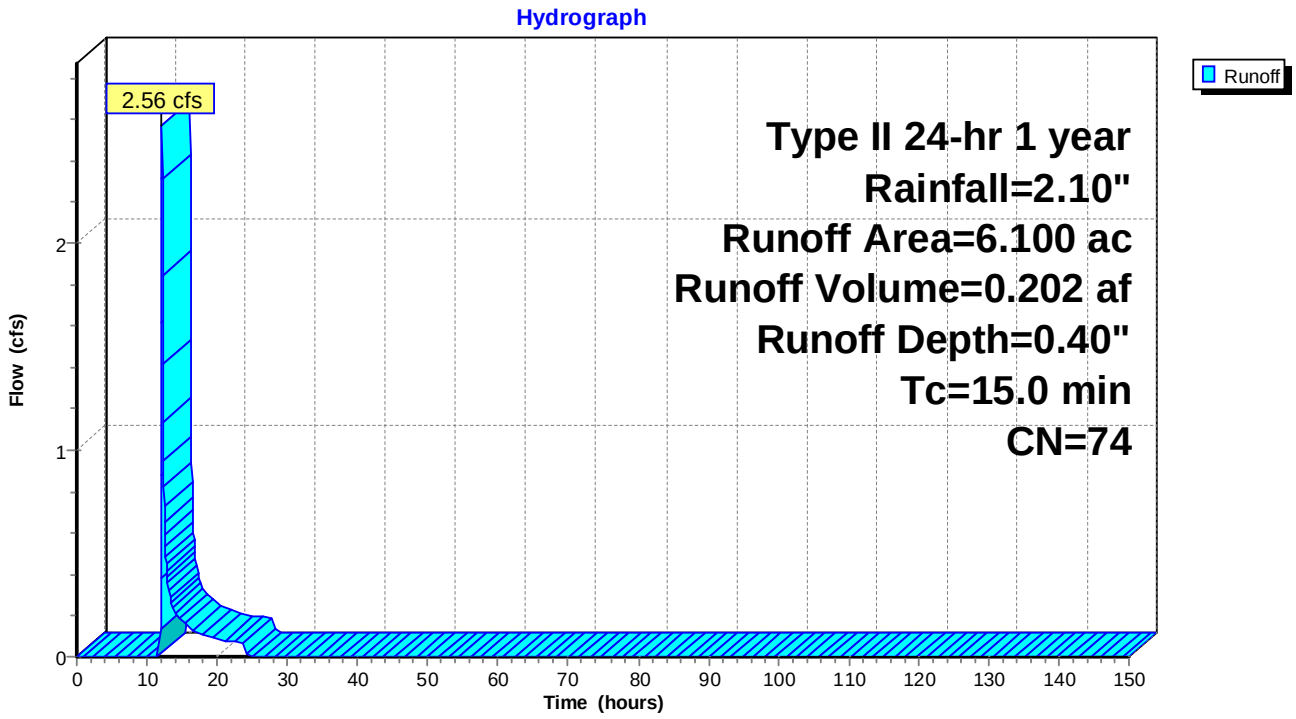
Runoff = 2.56 cfs @ 12.10 hrs, Volume= 0.202 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-150.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	6.100	74	
	6.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry,**

Subcatchment 2S: (new Subcat)



Summary for Pond 5P: CPv Pond

Inflow Area =	6.100 ac,	0.00% Impervious,	Inflow Depth =	0.40"	for 1 year event
Inflow =	2.56 cfs @	12.10 hrs,	Volume=	0.202 af	
Outflow =	0.10 cfs @	18.56 hrs,	Volume=	0.197 af,	Atten= 96%, Lag= 387.6 min
Primary =	0.10 cfs @	18.56 hrs,	Volume=	0.197 af	

Routing by Stor-Ind method, Time Span= 0.00-150.00 hrs, dt= 0.05 hrs
Peak Elev= 480.83' @ 18.56 hrs Surf.Area= 0.140 ac Storage= 0.116 af

Plug-Flow detention time= 845.9 min calculated for 0.197 af (97% of inflow)
Center-of-Mass det. time= 832.3 min (1,733.0 - 900.7)

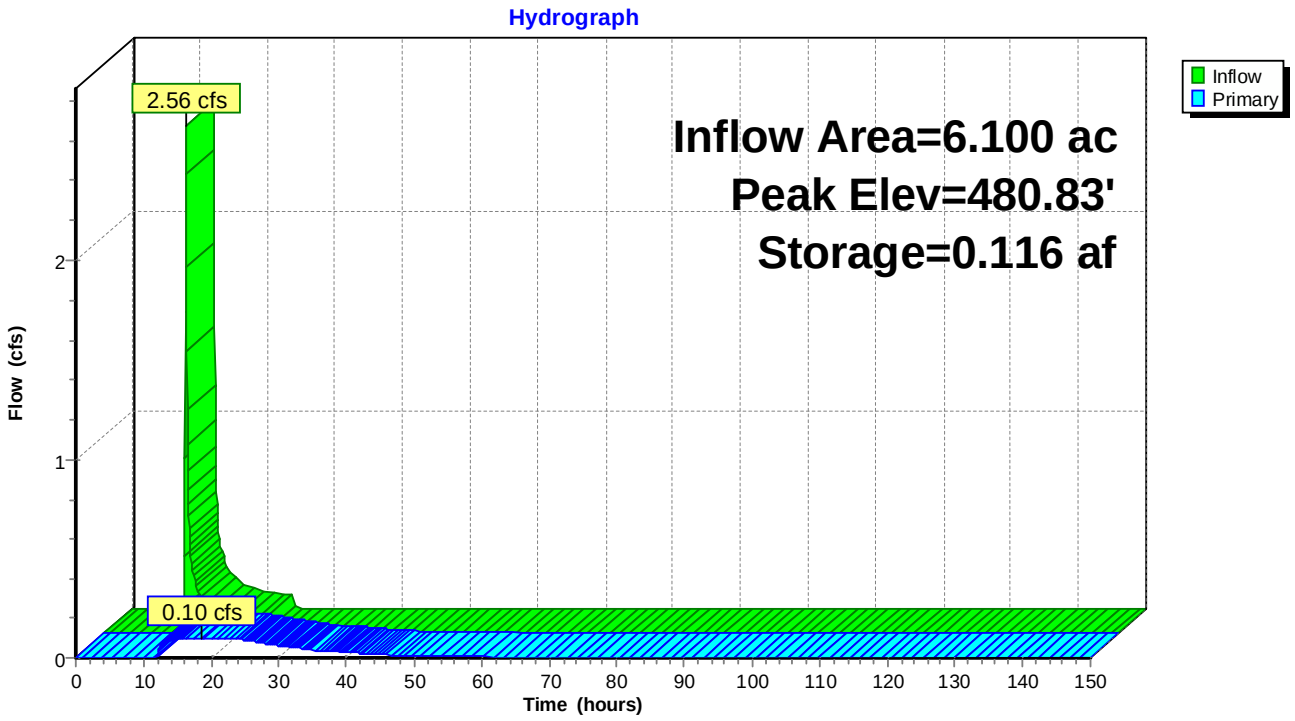
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.280 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.140	0.000	0.000
481.00	0.140	0.140	0.140
482.00	0.140	0.140	0.280

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**3.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 480.00' S= 0.0000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.10 cfs @ 18.56 hrs HW=480.83' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.10 cfs @ 2.05 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



TURTLE POND: PERMIT 2-1191

Source: USGS
Source: NASA, NGA, USGS
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32m
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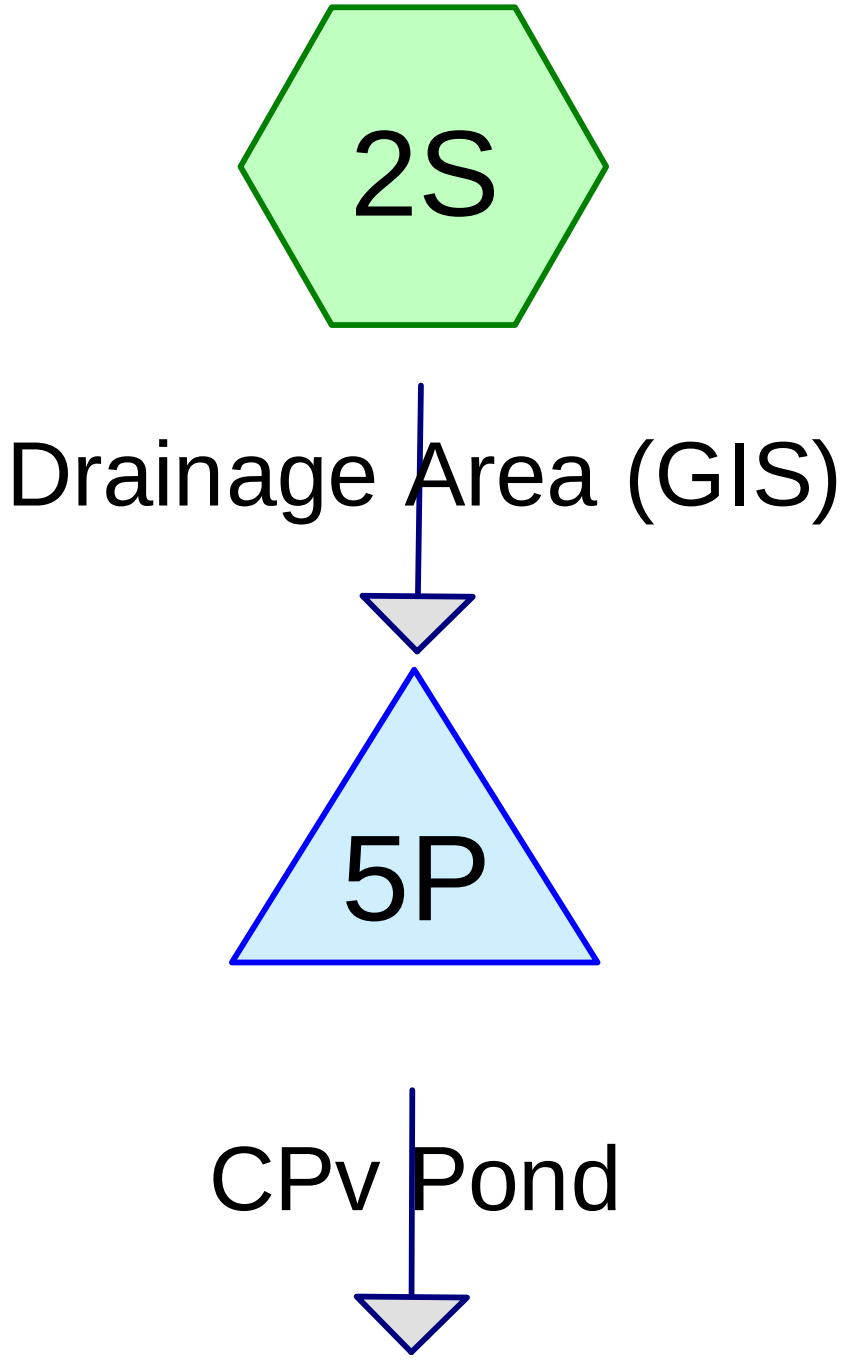
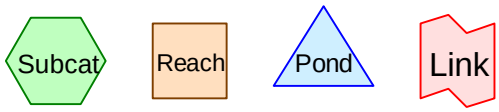




Drainage Diagram for 2-1191- D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
HydroCAD® 9.10 s/n 02762 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 2S: Drainage Area (GIS)

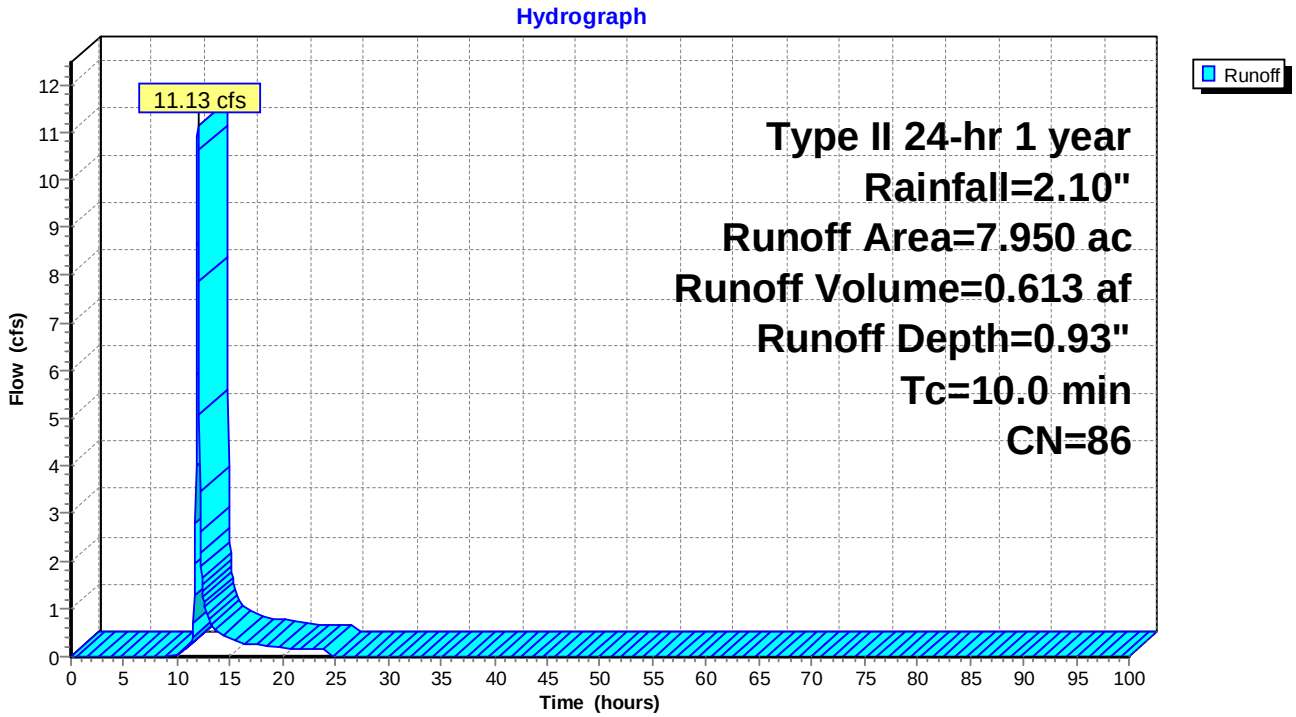
Runoff = 11.13 cfs @ 12.02 hrs, Volume= 0.613 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	2.580	98	
	5.370	80	>75% Grass cover, Good, HSG D
	7.950	86	Weighted Average
	5.370		67.55% Pervious Area
	2.580		32.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: Drainage Area (GIS)



Summary for Pond 5P: CPv Pond

Inflow Area = 7.950 ac, 32.45% Impervious, Inflow Depth = 0.93" for 1 year event
Inflow = 11.13 cfs @ 12.02 hrs, Volume= 0.613 af
Outflow = 0.40 cfs @ 14.71 hrs, Volume= 0.579 af, Atten= 96%, Lag= 161.3 min
Primary = 0.40 cfs @ 14.71 hrs, Volume= 0.579 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.43' @ 14.71 hrs Surf.Area= 0.850 ac Storage= 0.365 af

Plug-Flow detention time= 788.2 min calculated for 0.579 af (94% of inflow)
Center-of-Mass det. time= 759.5 min (1,602.3 - 842.8)

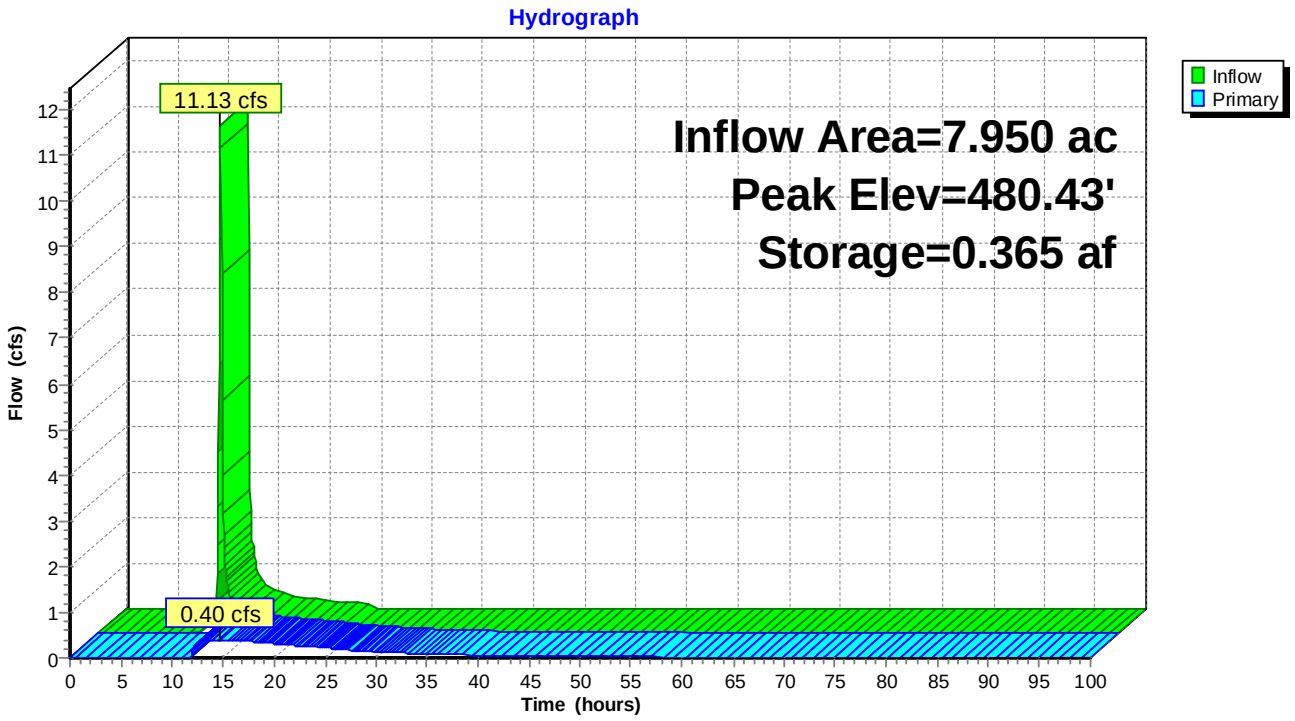
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.700 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.850	0.000	0.000
481.00	0.850	0.850	0.850
482.00	0.850	0.850	1.700

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**6.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.40 cfs @ 14.71 hrs HW=480.43' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.40 cfs @ 2.23 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CPv Pond



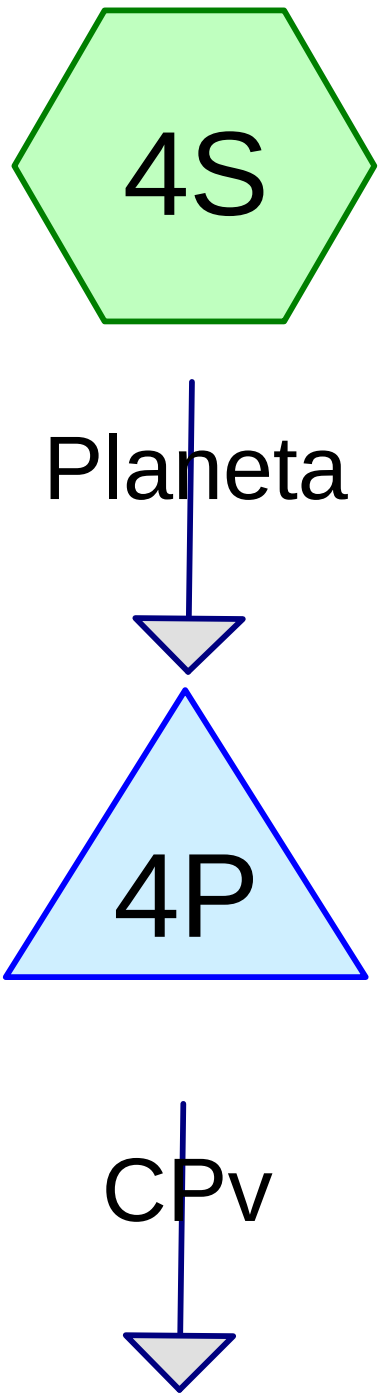
Google earth

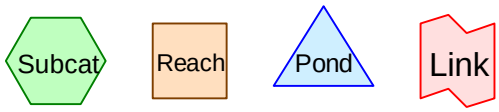
feet 1000

meters 400

HURRICANE LANE: PERMITS 1-1078, 1-1205, 1-1245, 1-1301, 2-1172

Source: USGS
Source: NASA, NGA, USGS
© 2008 Microsoft Corp.
50 m
esri®





Drainage Diagram for 1-1078-D&K
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Summary for Subcatchment 4S: Planeta

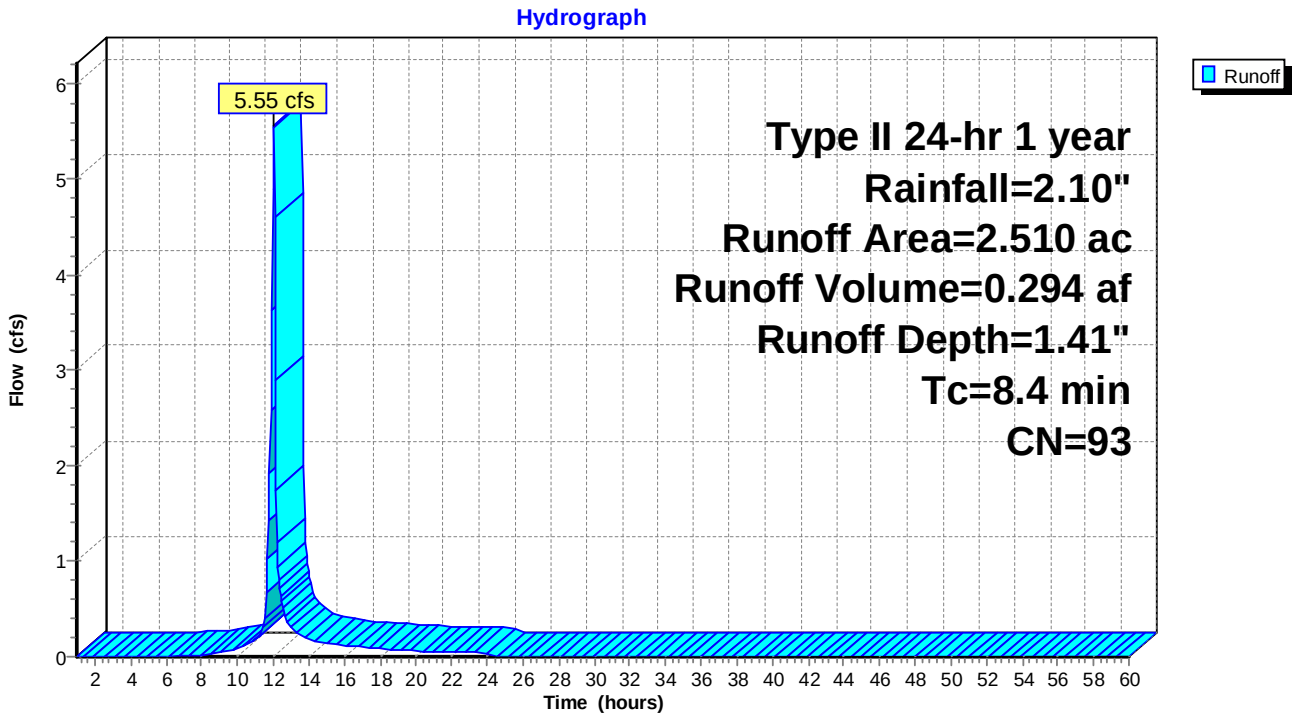
Runoff = 5.55 cfs @ 12.00 hrs, Volume= 0.294 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 1.00-60.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	2.510	93	
	2.510		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4					**Direct Entry,**

Subcatchment 4S: Planeta



Summary for Pond 4P: CPv

Inflow Area = 2.510 ac, 0.00% Impervious, Inflow Depth = 1.41" for 1 year event
Inflow = 5.55 cfs @ 12.00 hrs, Volume= 0.294 af
Outflow = 0.05 cfs @ 24.01 hrs, Volume= 0.192 af, Atten= 99%, Lag= 721.1 min
Primary = 0.05 cfs @ 24.01 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 1.00-60.00 hrs, dt= 0.05 hrs
Peak Elev= 480.96' @ 24.01 hrs Surf.Area= 0.250 ac Storage= 0.240 af

Plug-Flow detention time= 1,373.7 min calculated for 0.192 af (65% of inflow)
Center-of-Mass det. time= 1,271.6 min (2,078.9 - 807.3)

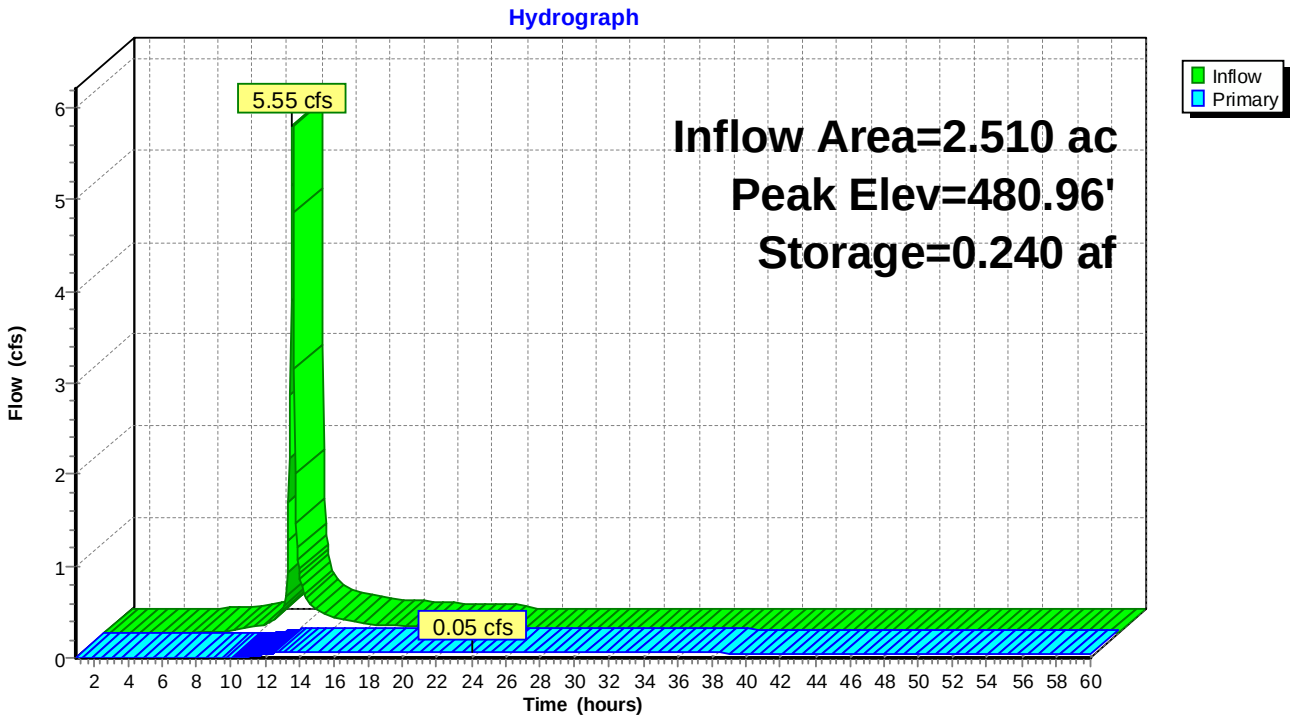
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.500 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

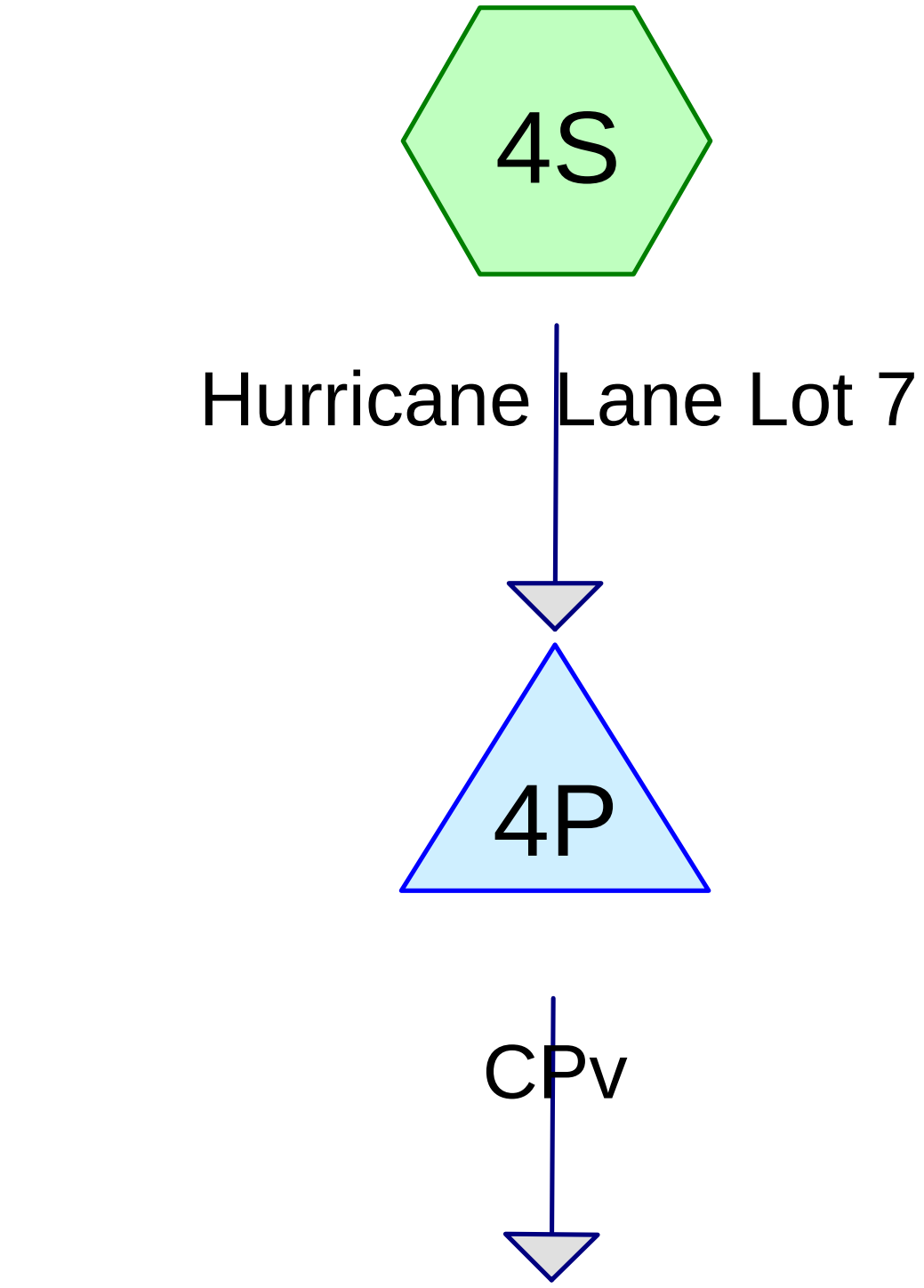
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.250	0.000	0.000
481.00	0.250	0.250	0.250
482.00	0.250	0.250	0.500

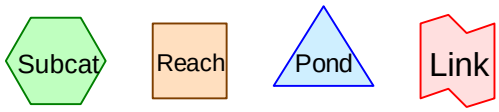
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.05 cfs @ 24.01 hrs HW=480.96' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.05 cfs @ 2.43 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
5.55 cfs
0.05 cfs
Inflow Area=2.510 ac
Peak Elev=480.96'
Storage=0.240 af
Flow (cfs)
0
1
2
3
4
5
6
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60
Time (hours)





Drainage Diagram for 1-1205-D&K
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Summary for Subcatchment 4S: Hurricane Lane Lot 7

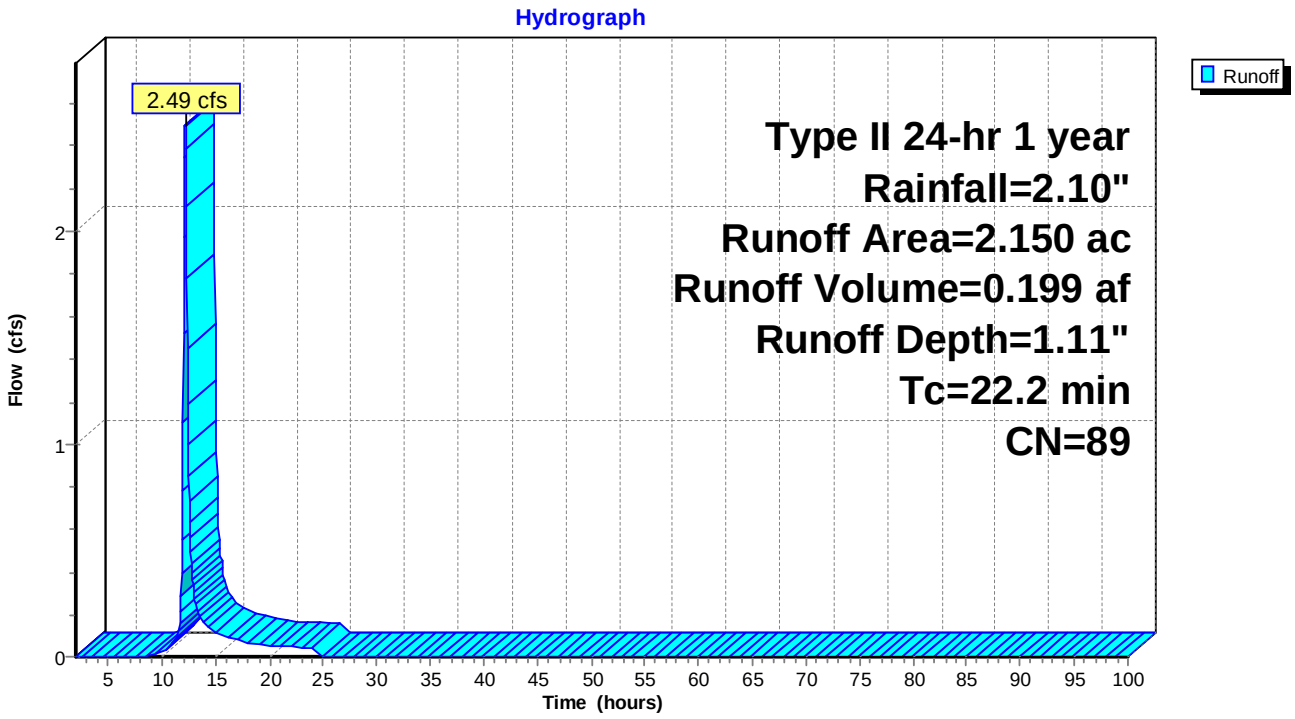
Runoff = 2.49 cfs @ 12.15 hrs, Volume= 0.199 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 2.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	2.150	89	
	2.150		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2					**Direct Entry,**

Subcatchment 4S: Hurricane Lane Lot 7



Summary for Pond 4P: CPv

Inflow Area = 2.150 ac, 0.00% Impervious, Inflow Depth = 1.11" for 1 year event
Inflow = 2.49 cfs @ 12.15 hrs, Volume= 0.199 af
Outflow = 0.05 cfs @ 19.99 hrs, Volume= 0.195 af, Atten= 98%, Lag= 470.3 min
Primary = 0.05 cfs @ 19.99 hrs, Volume= 0.195 af

Routing by Stor-Ind method, Time Span= 2.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.93' @ 19.99 hrs Surf.Area= 0.160 ac Storage= 0.149 af

Plug-Flow detention time= 1,419.9 min calculated for 0.195 af (98% of inflow)
Center-of-Mass det. time= 1,407.6 min (2,248.5 - 840.9)

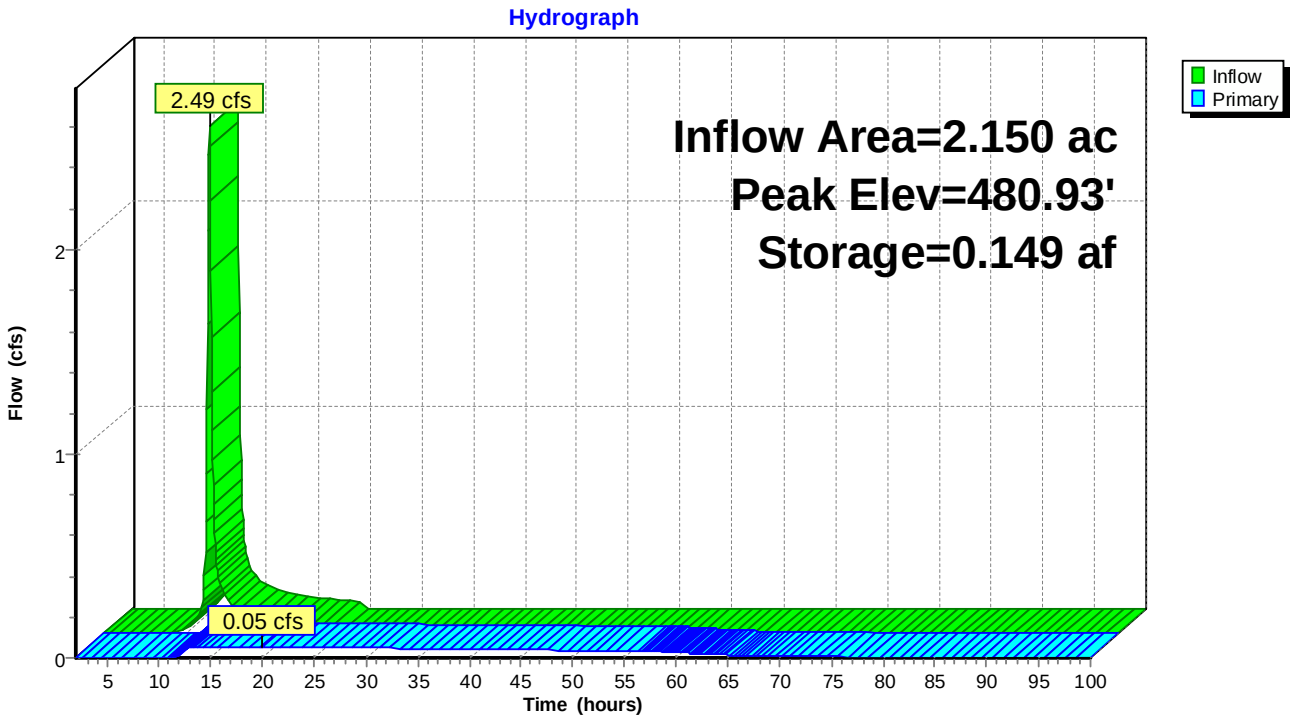
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.320 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

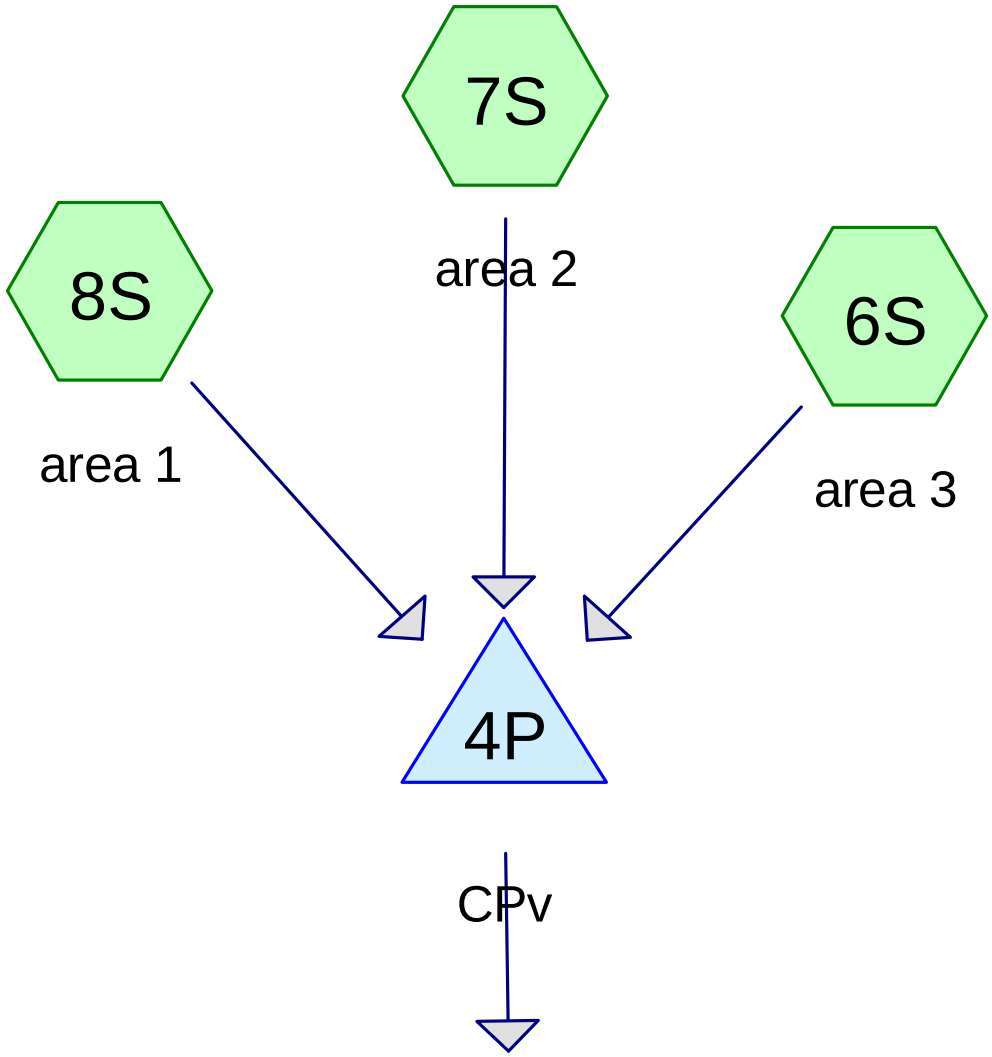
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.160	0.000	0.000
481.00	0.160	0.160	0.160
482.00	0.160	0.160	0.320

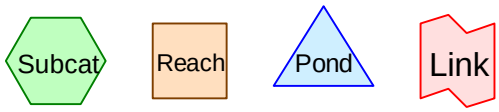
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.05 cfs @ 19.99 hrs HW=480.93' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.05 cfs @ 2.40 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
2.49 cfs
0.05 cfs
Inflow Area=2.150 ac
Peak Elev=480.93'
Storage=0.149 af
Flow (cfs)
0
1
2
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Time (hours)





Drainage Diagram for 1-1245- D&K
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Summary for Subcatchment 6S: area 3

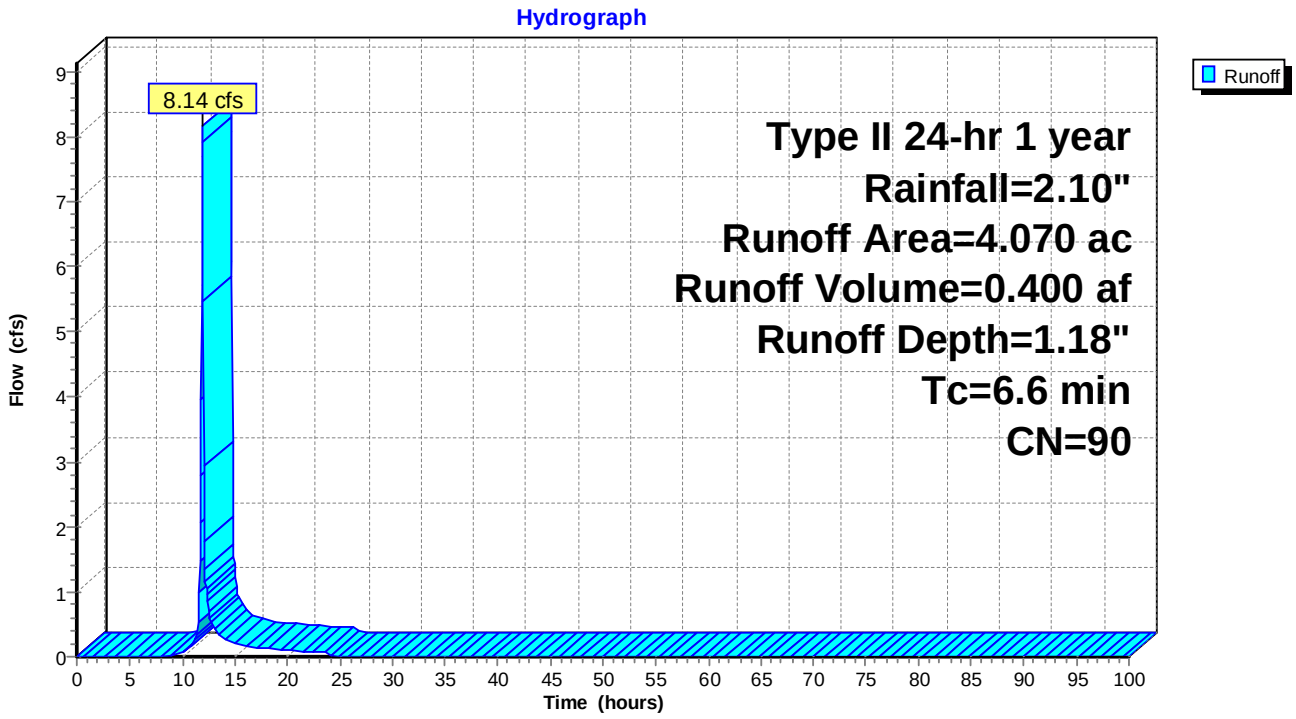
Runoff = 8.14 cfs @ 11.98 hrs, Volume= 0.400 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	4.070	90	
	4.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6					**Direct Entry,**

Subcatchment 6S: area 3



Summary for Subcatchment 7S: area 2

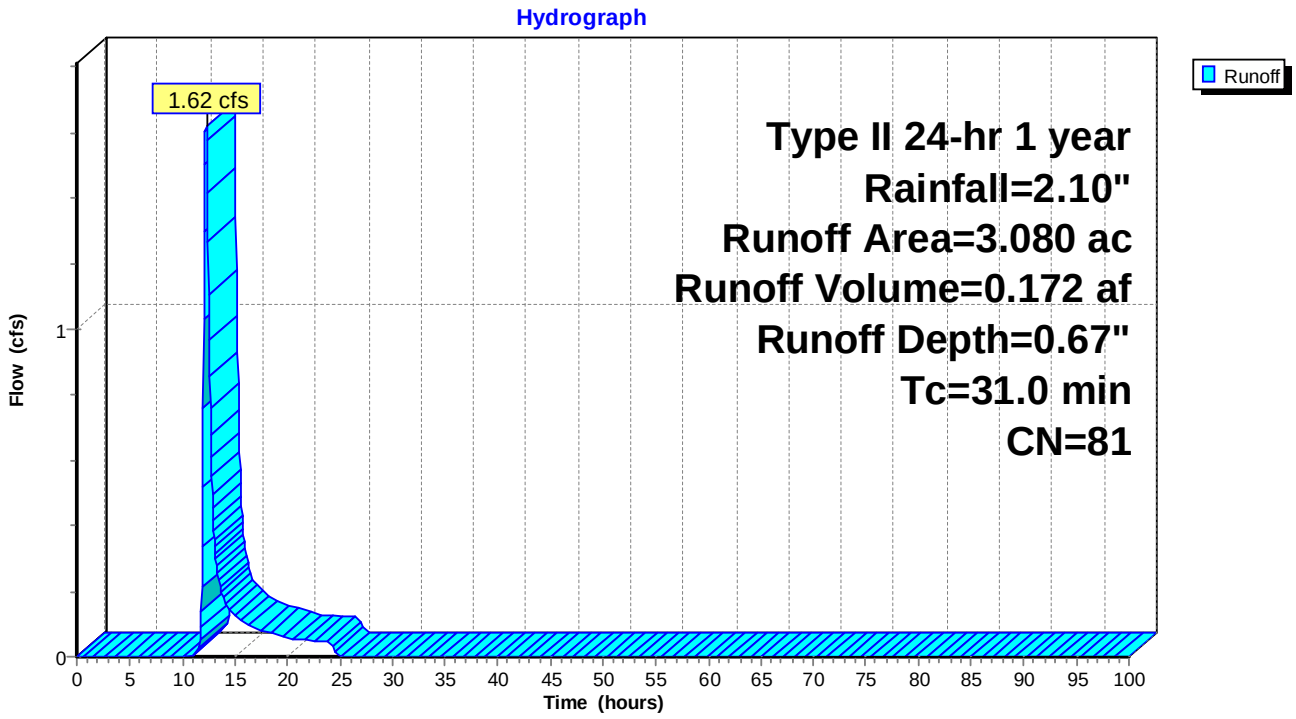
Runoff = 1.62 cfs @ 12.28 hrs, Volume= 0.172 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	3.080	81	
	3.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0					**Direct Entry,**

Subcatchment 7S: area 2



Summary for Subcatchment 8S: area 1

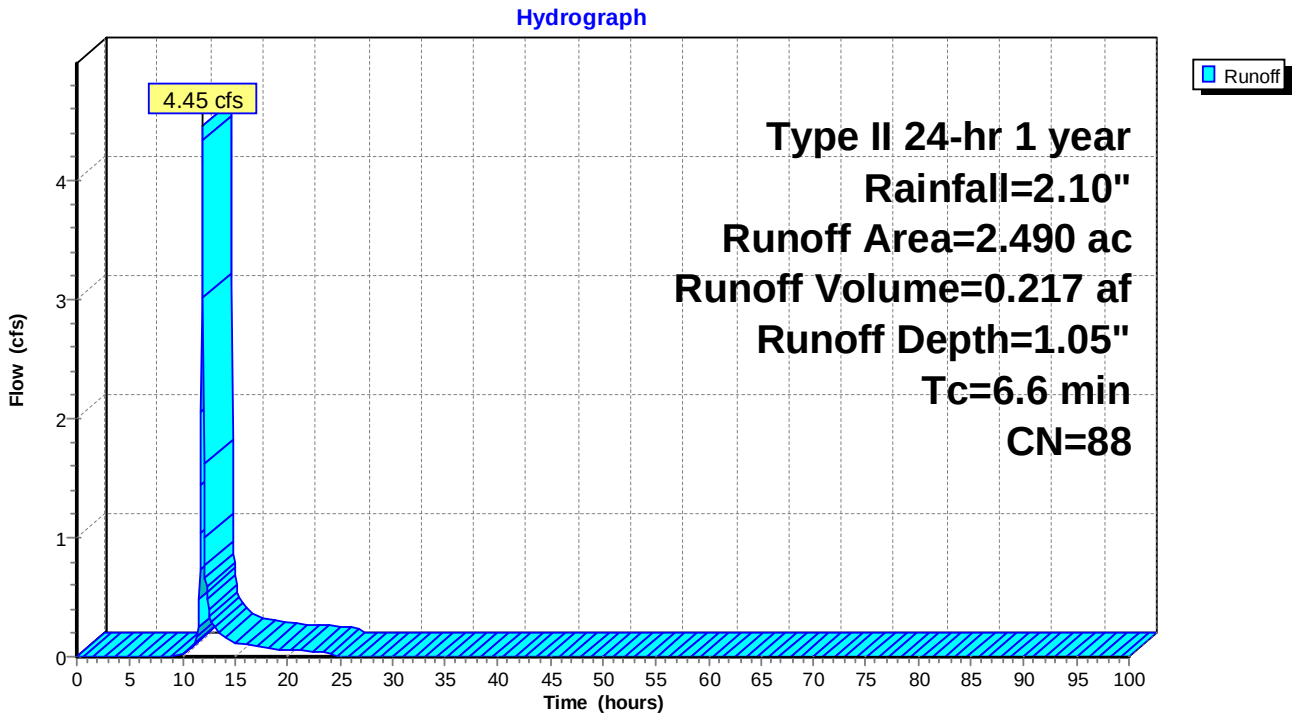
Runoff = 4.45 cfs @ 11.98 hrs, Volume= 0.217 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	2.490	88	
	2.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6					**Direct Entry,**

Subcatchment 8S: area 1



Summary for Pond 4P: CPv

Inflow Area = 9.640 ac, 0.00% Impervious, Inflow Depth = 0.98" for 1 year event
Inflow = 13.04 cfs @ 11.98 hrs, Volume= 0.789 af
Outflow = 0.37 cfs @ 16.05 hrs, Volume= 0.768 af, Atten= 97%, Lag= 244.1 min
Primary = 0.37 cfs @ 16.05 hrs, Volume= 0.768 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.93' @ 16.05 hrs Surf.Area= 0.550 ac Storage= 0.510 af

Plug-Flow detention time= 883.2 min calculated for 0.767 af (97% of inflow)
Center-of-Mass det. time= 869.2 min (1,706.8 - 837.6)

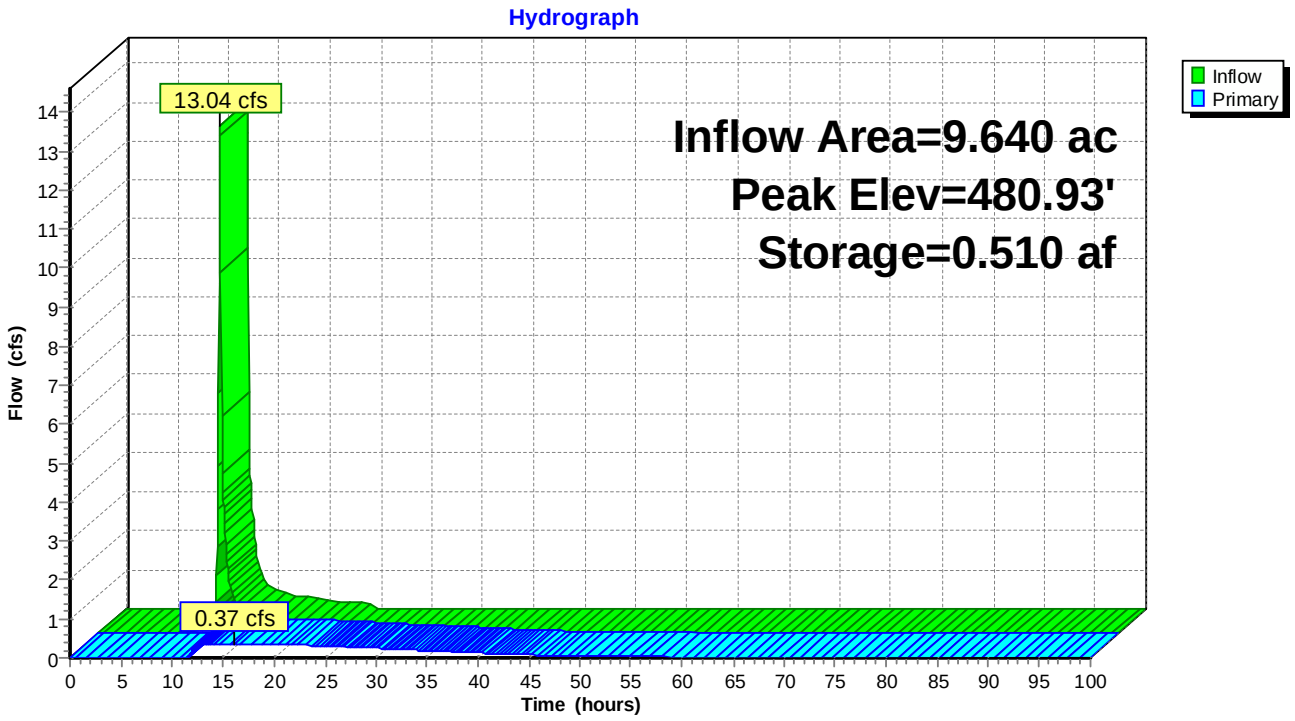
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	1.100 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

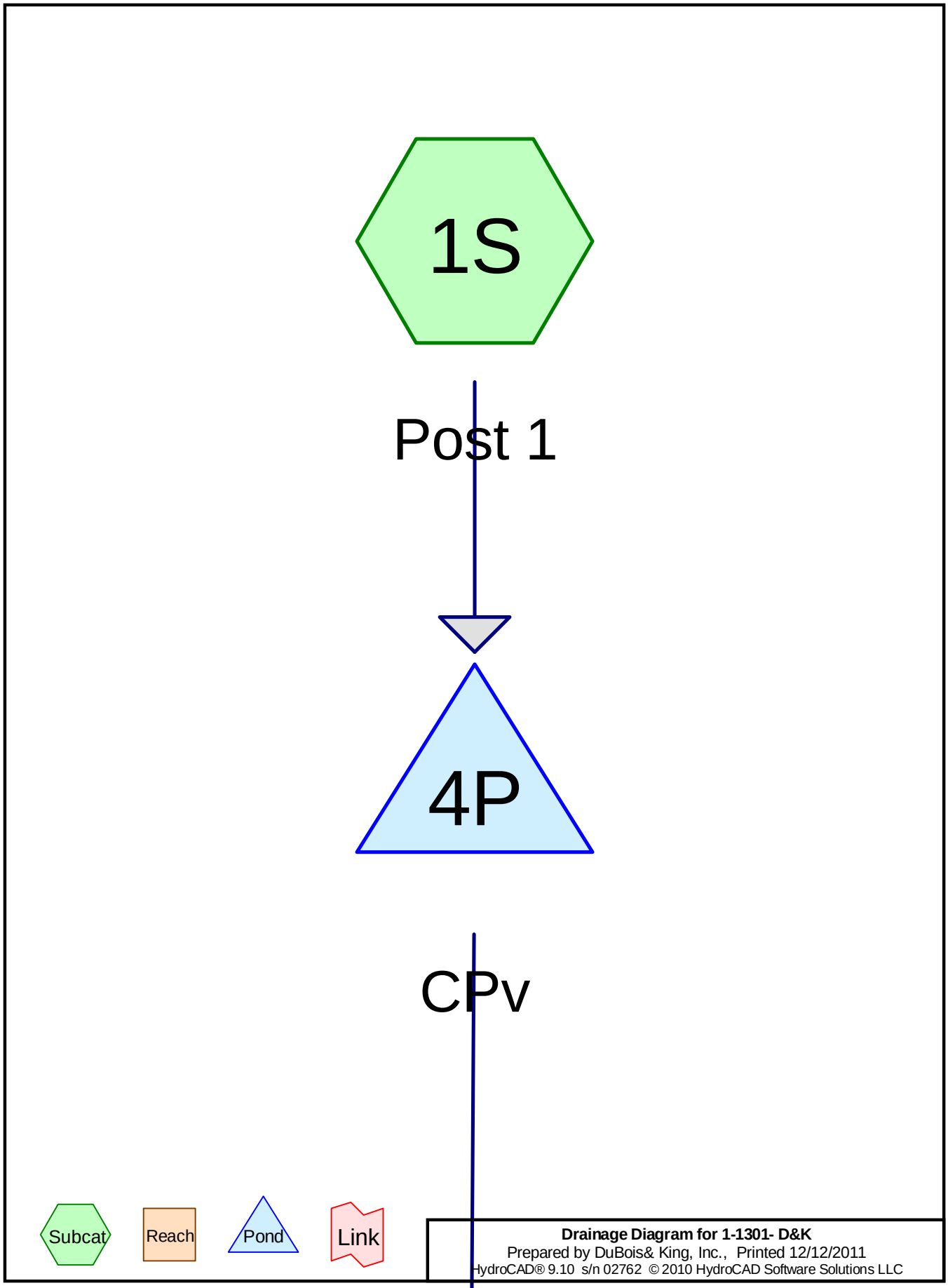
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.550	0.000	0.000
481.00	0.550	0.550	0.550
482.00	0.550	0.550	1.100

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**4.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 478.50' S= 0.1500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.37 cfs @ 16.05 hrs HW=480.93' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.37 cfs @ 4.20 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
13.04 cfs
0.37 cfs
Inflow Area=9.640 ac
Peak Elev=480.93'
Storage=0.510 af
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100


1S
Post 1
4P
CPv
Subcat
Reach
Pond
Link
Drainage Diagram for 1-1301- D&K
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Summary for Subcatchment 1S: Post 1

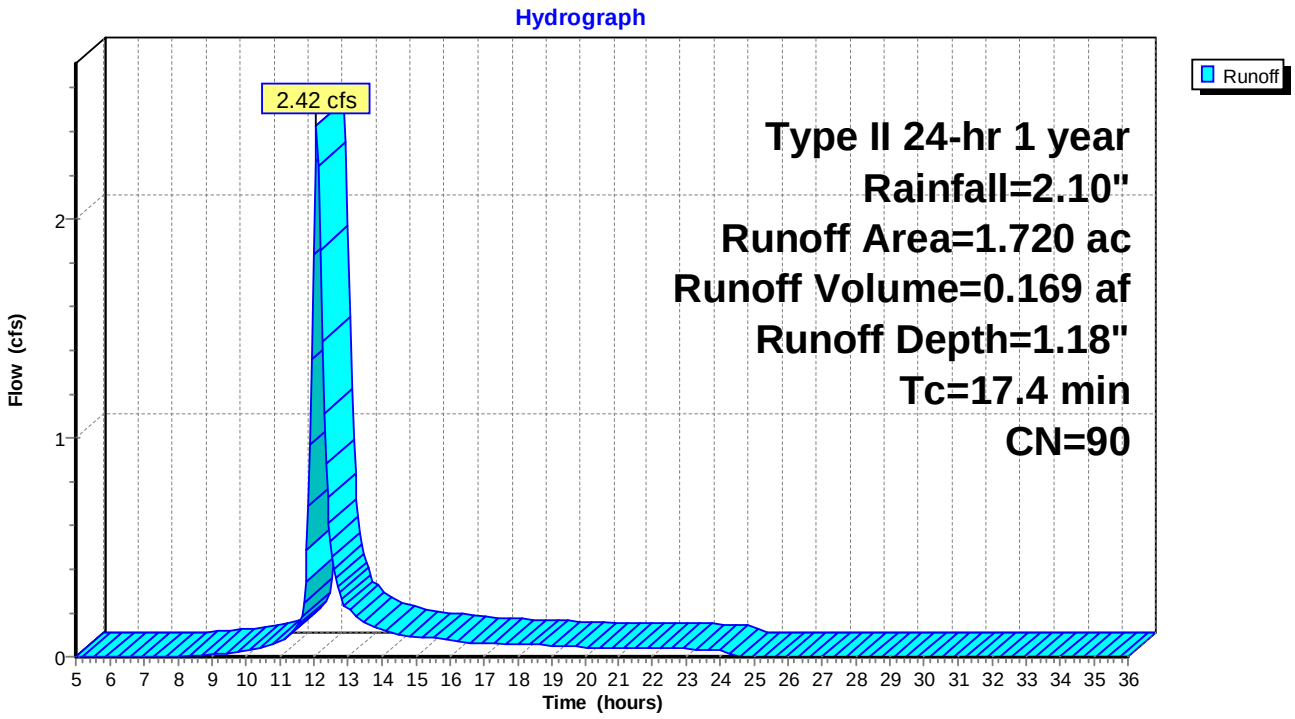
Runoff = 2.42 cfs @ 12.10 hrs, Volume= 0.169 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	1.720	90	
	1.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.4					**Direct Entry,**

Subcatchment 1S: Post 1



Summary for Pond 4P: CPv

Inflow Area = 1.720 ac, 0.00% Impervious, Inflow Depth = 1.18" for 1 year event
Inflow = 2.42 cfs @ 12.10 hrs, Volume= 0.169 af
Outflow = 0.01 cfs @ 24.33 hrs, Volume= 0.017 af, Atten= 100%, Lag= 734.0 min
Primary = 0.01 cfs @ 24.33 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 5.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 480.94' @ 24.33 hrs Surf.Area= 0.170 ac Storage= 0.160 af

Plug-Flow detention time= 773.3 min calculated for 0.017 af (10% of inflow)
Center-of-Mass det. time= 606.8 min (1,438.5 - 831.7)

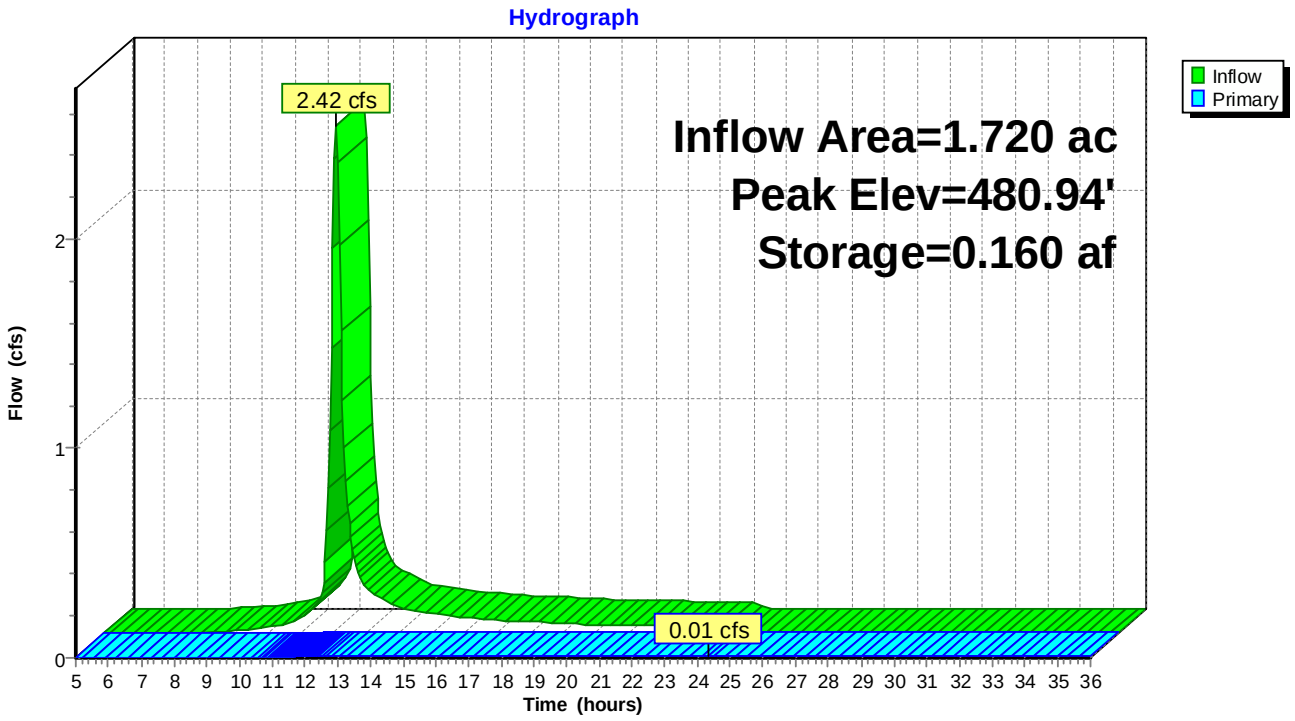
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.340 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

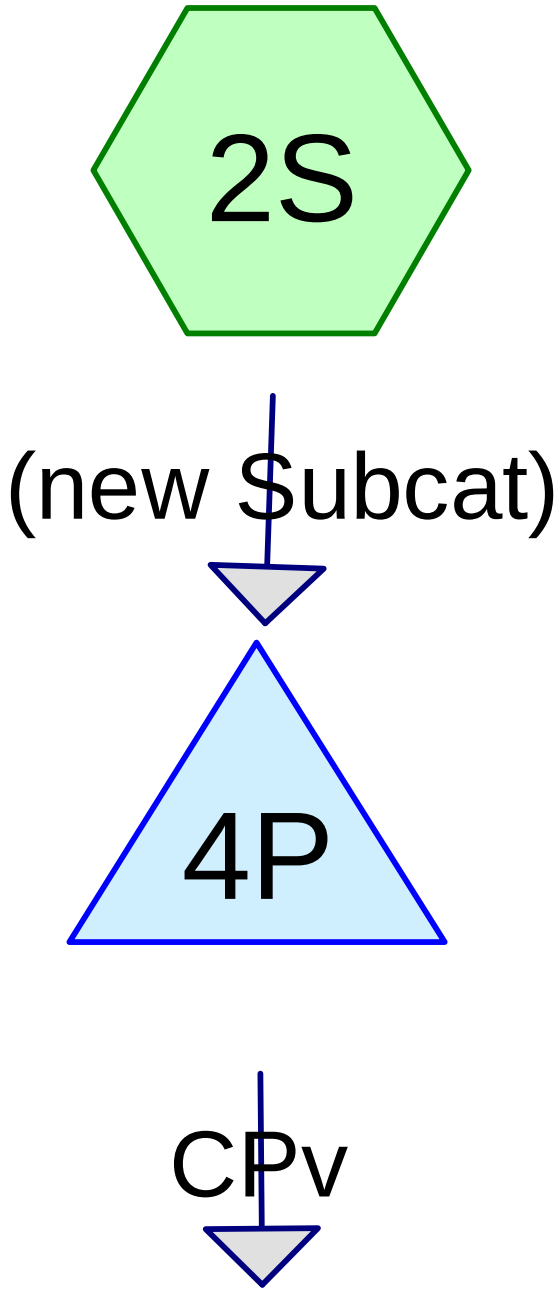
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.170	0.000	0.000
481.00	0.170	0.170	0.170
482.00	0.170	0.170	0.340

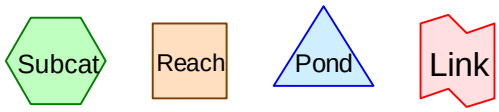
Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**1.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 479.50' S= 0.0500 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.01 cfs @ 24.33 hrs HW=480.94' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.01 cfs @ 1.62 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
2.42 cfs
0.01 cfs
Inflow Area=1.720 ac
Peak Elev=480.94'
Storage=0.160 af
Flow (cfs)
0
1
2
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
Time (hours)





Drainage Diagram for 2-1172_roadside - D&K
Prepared by DuBois& King, Inc., Printed 12/12/2011
HydroCAD® 9.10 s/n 02762 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 2S: (new Subcat)

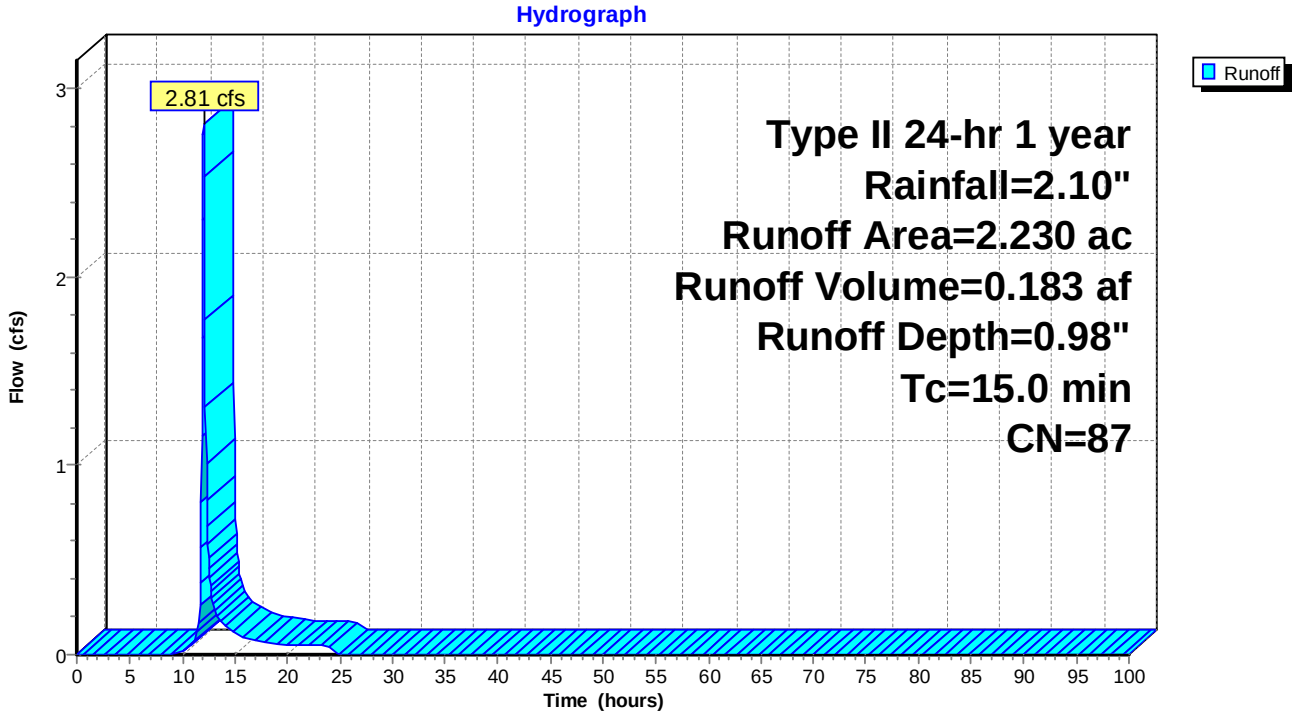
Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.183 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Type II 24-hr 1 year Rainfall=2.10"

	Area (ac)	CN	Description
*	0.820	98	
	1.410	80	>75% Grass cover, Good, HSG D
	2.230	87	Weighted Average
	1.410		63.23% Pervious Area
	0.820		36.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					**Direct Entry, estimate**

Subcatchment 2S: (new Subcat)



Summary for Pond 4P: CPv

Inflow Area = 2.230 ac, 36.77% Impervious, Inflow Depth = 0.98" for 1 year event
Inflow = 2.81 cfs @ 12.07 hrs, Volume= 0.183 af
Outflow = 0.08 cfs @ 16.74 hrs, Volume= 0.182 af, Atten= 97%, Lag= 280.1 min
Primary = 0.08 cfs @ 16.74 hrs, Volume= 0.182 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.05 hrs
Peak Elev= 480.99' @ 16.74 hrs Surf.Area= 0.120 ac Storage= 0.119 af

Plug-Flow detention time= 825.1 min calculated for 0.181 af (99% of inflow)
Center-of-Mass det. time= 822.3 min (1,665.5 - 843.2)

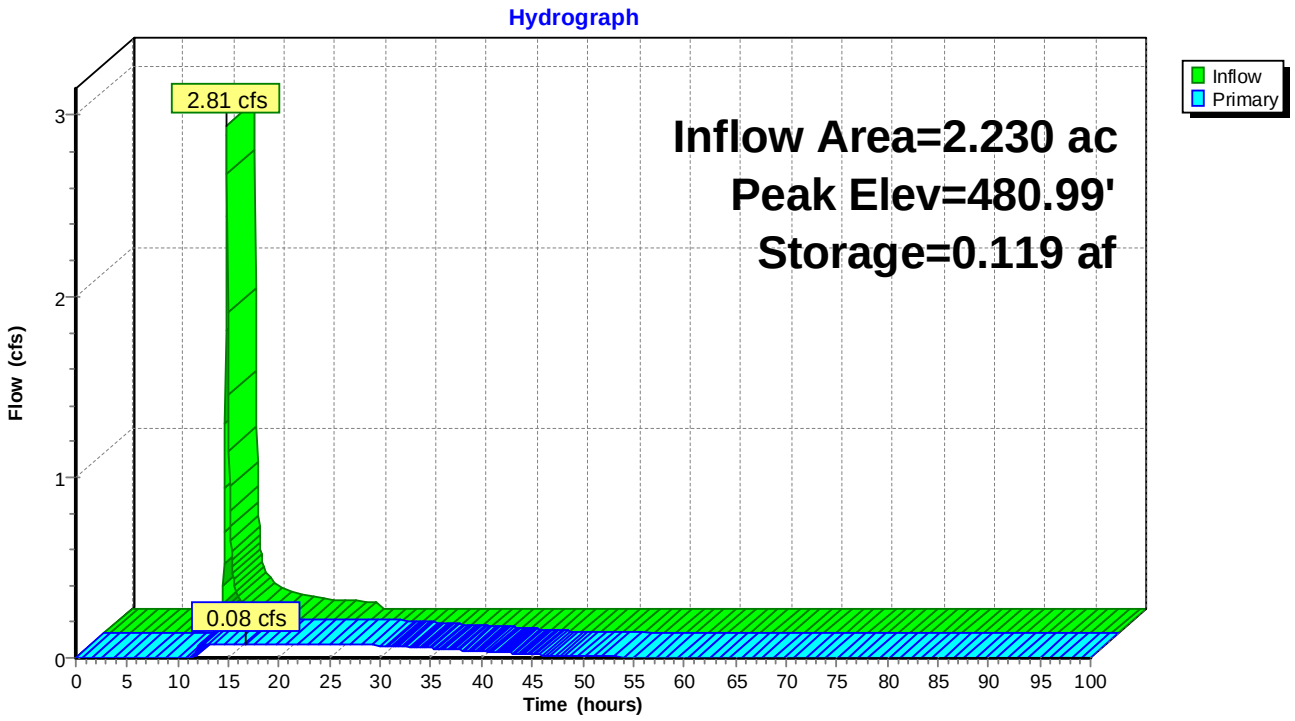
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	0.240 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
480.00	0.120	0.000	0.000
481.00	0.120	0.120	0.120
482.00	0.120	0.120	0.240

Device	Routing	Invert	Outlet Devices
#1	Primary	480.00'	**2.0" Round Culvert** L= 10.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 480.00' / 478.00' S= 0.2000 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Primary	481.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.08 cfs @ 16.74 hrs HW=480.99' (Free Discharge)
└─**1=Culvert** (Barrel Controls 0.08 cfs @ 3.59 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: CPv


Hydrograph
Inflow
Primary
2.81 cfs
0.08 cfs
Inflow Area=2.230 ac
Peak Elev=480.99'
Storage=0.119 af
Flow (cfs)
Time (hours)
0
1
2
3
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100